WESTERN BIRDS

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Cover photo by © B. "Moose" Peterson/WRP of Santa Barbara, California: California Gnatcatcher *(Polioptila californica)*, UC Irvine Ecological Preserve, Irvine, California, April 15, 1993. The site where this photo was taken has been sold to be developed as part of the San Joaquin Hills Toll Road.

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WESTERN BIRDS

Volume 25, Number 1, 1994

FIFTEENTH REPORT OF THE CALIFORNIA BIRD RECORDS COMMITTEE

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This article reports the results of the recent review of 232 records of 91 species by the California Bird Records Committee (hereafter the Committee or CBRC). Of these records, 171 were accepted, representing an acceptance rate of 73.7%. This report contains records from 1943 through 1990, although the vast majority are from 1989 through spring of 1990. As in the CBRC's 13th report (Pyle and McCaskie 1992), San Francisco was the best-represented county, with 23 accepted records, 20 of which were from Southeast Farallon Island. Other well-represented counties were San Diego (19), Marin (12), Monterey (12), Orange (11), and Kern (11).

Four species accepted in this report are new for California: the Common Pochard (*Aythya ferina*), Cave Swallow (*Hirundo fulva*), Red-flanked Bluetail (*Tarsiger cyanurus*), and Smith's Longspur (*Calcarius pictus*). Details of the state's first Red-headed Woodpecker (*Melanerpes erythrocephalus*) in 1962 are also included. Including the recent addition of the Little Bunting (*Emberiza pusilla*; McCaskie 1993), the California state list now stands at 580. Also treated in this report are potential California firsts of Townsend's Shearwater (*Puffinus auricularis*), Caribbean Coot (*Fulica caribaea*), Green Kingfisher (*Chloroceryle americana*), and Fieldfare (*Turdus pilaris*), none of which were accepted by the Committee. At the 1992 annual meeting, the CBRC established a Supplemental List to the California State List to include species of uncertain natural occurrence. The Oriental Greenfinch (*Carduelis sinica*), California records of which are detailed in this report, is the first addition to the Supplemental List.

All records reviewed by the CBRC are archived at the Western Foundation of Vertebrate Zoology, 439 Calle San Pablo, Camarillo, California 93010. All written documentation, photographs, voice recordings, and videotapes are housed there and are organized by CBRC record number. They are available to anyone interested in reviewing record documentation and the CBRC's assessment. Aside from recent additions to California's

avifauna, the CBRC Review List has not changed since published by Langham (1991) and updated by Pyle and McCaskie (1992) and Roberson (1993). In addition to reviewing each submitted record, the Committee reviews all records of Review List species published as occurring in California. The Committee solicits information on all occurrences of species on its Review List, published or not, and encourages observers to support the Committee review process by submitting written reports, photographs, tape recordings, and other documentation to Michael A. Patten, CBRC Secretary, at the address above. See Pyle and McCaskie (1992) for more information about the Committee's review process.

Format. The format of this report is similar to those of recent Committee reports (Langham 1991, Pyle and McCaskie 1992, Roberson 1993). Records are listed chronologically by first date of occurrence except when an alternate arrangement provides a clearer presentation of the CBRC's decisions. Each record includes the locality, a standard abbreviation for the county (see below), and a full date span. In general, the date span follows the dates published in the seasonal reports of *American Birds* or other sources. If the Committee has information indicating that a published date span is incorrect, the CBRC-accepted date is listed in italics. Initials of the observers who submitted documenation to the Committee are listed alphabetically (by surname) in parentheses. The CBRC record number is included at the end of this list. If the observer(s) originally finding/identifying the bird submitted documentation, their name(s) are listed first, followed by a semicolon. All records are sight records, unless otherwise noted. See Table 1 for a summary of the symbols used in this report.

When birds return to a locality after a lengthy absence (e.g., for consecutive winters) or remain for a number of years, each subsequent occurrence, or occurrence in a new calendar year, is reviewed as if new (i.e., a new record number is assigned) and the Committee suggests, by simply majority vote, whether or not the same individual is involved. The Committee does not formally decide the age, sex, or subspecies of a given bird. Thus all the following annotations are our own, although our opinions are usually based at least in part on the comments of Committee members, who often remark on age, sex, and subspecies issues when reviewing a record. Some of the designations we have included reflect the collective opinion of the Committee.

Abbreviations. The Committee has adopted the following standard abbreviations for counties (only those included in this report are listed): ALA, Alameda; BUT, Butte; CC, Contra Costa; DN, Del Norte; ED, El Dorado; FRE, Fresno; GLE, Glenn; HUM, Humboldt; IMP, Imperial; INY, Inyo; KER, Kern; LA, Los Angeles; MEN, Mendocino; MNO, Mono; MOD, Modoc; MRN, Marin; MTY, Monterey; NAP, Napa; ORA, Orange; PLU, Plumas; RIV, Riverside; SBA, Santa Barbara; SBE, San Bernardino; SBT, San Benito; SCL, Santa Clara; SCZ, Santa Cruz; SD, San Diego; SF, San Francisco; SIS, Siskiyou; SLO, San Luis Obispo; SM, San Mateo; SON, Sonoma; TRI, Trinity; TUL, Tulare; TUO, Tuolumne; VEN, Ventura. See Langham (1991) for a complete list of the 58 standard county abbreviations.

Table 1 Symbols Used in the Species Accounts

Symbol	Meaning
* before a species' name	The species is no longer on the CBRC Review List.
Number in parentheses following a species	The number of CBRC-accepted records through this report. For species no longer on the Review List, this number indicates only those accepted while records of the species were being reviewed by the Committee.
** following the number in parentheses	The number of accepted records includes only records within a restricted review period or the number includes records statistically accepted. See Roberson (1986) for more information.
† after an observer's name	The observer supplied a photograph supporting acceptance of the record.
# followed by a code and a number	A specimen record. The code is a standard abbreviation for the housing institution (see text) and the number is the catalogue number in that institution.

Abbreviations for museums cited in this report are CAS, California Academy of Sciences, San Francisco; CSULB, California State University, Long Beach; LACM, Natural History Museum of Los Angeles County, Los Angeles; MLZ, Moore Laboratory of Zoology, Occidental College, Los Angeles; SBCM, San Bernardino County Museum, Redlands; SBMNH, Santa Barbara Museum of Natural History, Santa Barbara; SDNHM, San Diego Natural History Museum, San Diego; WFVZ, Western Foundation of Vertebrate Zoology. Other abbreviations are AFB, air force base; Co., county; I., island; L., lake; mi., miles; mtn., mountain; nmi., nautical miles; NS, national seashore; NWR, national wildlife refuge; ph., photograph; pt., point; SB, state beach; SP, state park.

RECORDS ACCEPTED

YELLOW-BILLED LOON *Gavia adamsii* (50). One, probably a first-winter bird, was observed at Monterey, MTY, 30 Jan 1982 (TCh; 65-1990). A juvenile was on L. Havasu, SBE, from 24 Dec 1989 to 14 Mar 1990 (JLD†, GMcC, MAP; 10-1990); a photograph of it appeared in *Am. Birds* 44:302. One, probably a first-winter bird, was in Trinidad Harbor, HUM, 14 Mar–15 Apr 1990 (RAE, LPL; 73-1990).

The L. Havasu bird was originally discovered on the Arizona side of the lake but was seen regularly on both sides. Dates above include its entire stay, although it apparently arrived several days before it was first detected in California. In addition to being Arizona's second record, this is only the second inland record for California,

the first being of a first-winter bird seen and photographed at L. Perris, RIV, 20 Dec 1983–4 May 1984 (Roberson 1986).

The description of the Trinidad bird mentions white shafts to the outer primaries, a characteristic of the Yellow-billed Loon (Binford and Remsen 1974, Phillips 1990).

MOTTLED PETREL *Pterodroma inexpectata* (22). One was at 32°44' N, 122°33' W, 123 nmi. SW of San Miguel I., SBA, 15 Nov 1989 (PP; 161-1989) and another was at 33°57' N, 121°39' W, 61 nmi. west of San Miguel I., 17 Nov 1989 (PP; 162-1989). Increased pelagic work beyond the contintental shelf in recent years is showing this species to be regular there from November through February.

*MURPHY'S PETREL *Pterodroma ultima* (113). Four were between 33°30' N and 33°45' N, 121°30' W and 122° W, about 70–90 nmi. SW of Pt. Conception SBA, 11 May 1987, and three were between 33°20' N and 33°40' N, 123°50' W and 124°10' W, about 150–180 nmi. WSW of Pt. Conception, SBA, 12 May 1987 (RRV; 191-1987). This species has proved to be regular in the deep water far off California, particularly from April through June (Bailey et al. 1989b, Roberson 1993).

*WILSON'S STORM-PETREL *Oceanites oceanicus* (127). One was about 5 mi. SW of the Angel's Gate entrance to Los Angeles Harbor, LA, 7 Aug 1983 (KLG; 6-1990). One off Cordell Bank, MRN, on 13 Jul 1986 (Langham 1991) is the only earlier report for our "fall," although there are two spring records for California: Monterey Bay, MTY, 1 May 1978 (Roberson 1986) and 21 nmi. WSW of Pt. Reyes, MRN, 10 Jun 1989 (Pyle and McCaskie 1992).

Up to four were with the Monterey Bay, MTY, storm-petrel rafts 21 Aug–16 Oct 1988 (DGY, KH; SFB, JLD, GMcC, DLS, RFT; 185-1988); the species is a regular fall visitor to Monterey Bay. One about 30 nmi. west of San Diego, SD, 10 Sep 1988 (JLD; 240-1988) was accepted as probably the same bird present in the same area 28 Aug 1988 (Pyle and McCaskie 1992). Ten were at Cordell Bank, 25–28 nmi. WNW of Pt. Reyes, MRN, 13 Aug 1989 (RS; 171-1989).

WEDGE-RUMPED STORM-PETREL *Oceanodroma tethys* (5). One was at 32°08' N, 120°37' W, 83 nmi. SW of San Nicolas I., VEN, 23 Jul 1989 (PP†; 108-1989); a photograph of it was published (upside-down) in *Am. Birds* 43:1367. The five records for California are of single birds in July, August, September, October, and January.

MASKED BOOBY *Sula dactylatra* (2). A first-year bird 2 mi. west of Pt. Lobos State Reserve, MTY, 5 Apr 1990 (Figure 1; DL†; 52-1990) was the first of its species photographed in California. Additional information regarding this bird, found and photographed by a long-time skipper of pelagic birding trips, was supplied by Alan Baldridge and Don Roberson, the latter correcting the understandable misidentification of this bird as a Brown Booby. The only previous record for California was one observed SW of San Clemente I., LA, 10 Jan 1977 (Lewis and Tyler 1978, Luther et al. 1979).

There are two distinct populations of Masked Boobies in the Pacific Ocean. Adults can be differentiated by bill color, which is yellowish or greenish-yellow in *S. d. personata* from the central Pacific and *S. d. californica* from off western Mexico, and pale pinkish-orange in *S. d. granti* from the Galapagos Islands south to Chile. Small numbers of orange-billed birds, presumably *S. d. granti*, breed sympatrically with large numbers of *S. d. californica* on Clipperton and San Benedicto islands off of west Mexico (Robert L. Pitman, *fide* K. L. Garrett).

Upon acceptance, this record was sent to Pitman for subspecific identification. Pitman (*in litt.*) replied that while bill coloration can be used to separate adults, "quite a few subadults, and even juveniles," determination "requires good light and may then not always be possible." Nevertheless, Don Roberson (*in litt.*) indicated that the

plumage of immatures from yellow-billed populations is generally "deep chocolate brown," whereas immatures from orange-billed populations are "decidedly gray." Roberson further stated that the Pt. Lobos bird appeared to be of a yellow-billed population.

BLUE-FOOTED BOOBY *Sula nebouxii* (70**). Up to four were at various locations around the Salton Sea, IMP/RIV, 12 Jul–30 Sep 1990 (JLD†; SFB, NBB, GMcC, MJL†, MAP†; 100-1990); a photograph of one appeared in *Am. Birds* 44:1185. An adult male was found dying along an irrigation canal 4½ mi. SW of Seeley, IMP, 2 Sep 1990 (#SDNHM 46903; 47-1992). These Blue-footed Boobies were the first to "invade" the Salton Sea since 1980 (Roberson 1993). See McCaskie (1970) for more information about these invasions.

BROWN BOOBY *Sula leucogaster* (28). An injured adult male of the subspecies *brewsteri* was picked up at Imperial Beach, SD, 2 Apr 1990, then was transported to a rehabilitation center, where it died on 9 Apr 1990 (#SDNHM 46566; 48-1992). The date of this bird was a surprise, as all previous California Brown Boobies have occurred between mid-June and late November, except for one bird, part of the influx of eight into the Salton Sea in the fall of 1969, that remained into the following April (Dunn 1988).

REDDISH EGRET *Egretta rufescens* (51). An adult at the south end of San Diego Bay, SD, 13 Sep 1989–23 Jan 1990 (GMcC, DP; 190-1989) was the same bird with a deformed bill that has wintered in the vicinity (it has also been seen at Chula Vista and at the Tijuana R. mouth) every year since 1982/1983. The previous dates of occurrence are 18 Dec 1982–26 Mar 1983 (Roberson 1986), 18 Jan–15 Mar

Figure 1. First-year Masked Booby (52-1990) 2 mi. west of Pt. Lobos State Reserve, Monterey County, 5 April 1990, the second Masked Booby for California and the first photographed. The inverted "V" of white extending up the breast distinguishes the first-year Masked from the adult Brown Booby.

Photo by David Lemon

1984, 12 Dec 1984–9 Mar 1985 (ph.; Dunn 1988), 9 Nov 1985–26 Jan 1986 (Bevier 1990); 13 Oct 1986–31 Jan 1987 (Langham 1991), 25 Sep 1987–12 Mar 1988, and 11 Sep 1988–7 Feb 1989 (Pyle and McCaskie 1992).

Seven adults at the south end of San Diego Bay, SD, 6 May 1990 (GMcC; 91-1990) constituted the largest flock ever recorded in California. An adult at the same location on 23 Mar 1990 (LuS; 190-1990) and three adults together at the San Diego R. mouth, SD, 26 Apr 1990 (CGE; 214-1990) were considered part of this same group; thus, up to seven were accepted from the area for the period 23 Mar–6 May 1990. An adult at Pt. Mugu, VEN, 17–19 Apr 1990 (BBA; 81-1990) and an adult photographed at Ballona Lagoon, LA, 27 Apr 1990 also may have been part of this group.

An immature well seen in flight at the Whitewater R. mouth, north end of the Salton Sea, RIV, on 28 Jul 1990 (GMcC; MAP; 111-1990) is only the sixth accepted for the interior of California and the fourth for the Salton Sea. An immature at Elkhorn Slough, Moss Landing, MTY, 28 Dec 1989–25 Jan 1990 (CR; JLD, KLG, GMcC, RN, DR†; 206-1989) was only the second for the northern half of the state. The bird was found dead on the latter date; the complete skeleton is preserved as CAS 84409.

YELLOW-CROWNED NIGHT-HERON *Nyctanassa violacea* (12). An adult at La Jolla, SD, 3–24 Mar 1990 and at Los Peñasquitos Lagoon, SD, 1 Dec 1990 (GMcC; 63-1990) was considered the same bird that has been continually present between La Jolla and San Elijo Lagoon, SD, since 1981. Previous dates were 25 Oct 1981–3 Jan 1982 (Binford 1985), 30 May–19 Jul 1982 (ph.), 20 Feb–29 Aug 1983 (Morlan 1985), 19 Aug–9 Oct 1984 (Dunn 1988), 19–31 Mar 1985, 5 Dec 1985–25 Jan 1986 (Bevier 1990), 9–25 Apr 1987 (Langham 1992), 16 Jan–28 Feb 1988, and 4 May–27 Jul 1989 (ph.; Pyle and McCaskie 1992).

BLACK-BELLIED WHISTLING-DUCK *Dendrocygna autumnalis* (9). Nine together at Finney Lake, IMP, 20 Apr 1990 (DEQ†; 104-1990) constituted the largest flock ever reported in California. The previous high count was of three birds photographed at the Wister Unit of the Imperial Wildlife Area, IMP, 15 Oct–4 Nov 1973 (Luther et al. 1979). The previous early date was 29 May, when two were photographed near Obsidian Butte at the south end of the Salton Sea, IMP, in 1985 (Bevier 1990). Prior records probably represent dispersing post-breeding birds. By contrast, the 1990 flock was likely a spring overshoot, since this species migrates north into southeastern Arizona to breed (Monson and Phillips 1981), though it has also begun to winter in the Phoenix area in fairly large numbers (e.g., 40+ in 1991/1992; *Am. Birds* 46:296).

TRUMPETER SWAN *Cygnus buccinator* (18). One seen with a flock of Tundra Swans (*C. columbianus*) at Nelson, BUT, 10 Feb 1989 (JHS; 52-1989) was identified solely by its wearing a red neck collar with a white alphanumeric code. According to information maintained by the Trumpeter Swan Society, graciously supplied by Bruce E. Deuel, the only swans marked with red collars are Trumpeters and the white coding indicated that the bird was collared in the southern Mackenzie District, Northwest Territories, Canada.

GARGANEY *Anas querquedula* (9). Single birds were shot by hunters at an unknown location in Solano Co., 23 Oct 1977 (#CAS 84149; 67-1990) and at an unknown location in Kern Co., 10 Dec 1978 (#CAS 84150; 68-1990). Only the wings of these birds have been preserved. Bruce E. Deuel provided the Committee with a description of a wing of a bird taken by Bruce Thomas at Mendota Wildlife Area, FRE, 3 Dec 1989 (BEDe, WM†; 56-1990) and also provided photographs of the wing that were taken by Woody Martin of Patuxent Wildlife Research Center in Laurel, Maryland, where the wing apparently remains.

A male, probably an adult, was near Guadalupe and at the Santa Maria R. mouth, SBA/SLO, 15 Oct–4 Nov 1989 (SEF†; JLD, PEL†, GMcC, MO, MAP, RST; 117-1989); a photograph of it appeared in *Am. Birds* 44:161 and in *Birding* 24:216. The discovery of this individual came on the heels of one at Nehalem, Oregon, 17–20 Sep 1988 (Johnson and Lethaby 1991), the first fall Garganey detected by birders in western North America south of Alaska. There are at least three fall records of birds taken by hunters: the two discussed above and one of a female taken 12 Oct 1980 at Pt. Alberni, Vancouver I., British Columbia (Spear et al. 1988).

A male at the Bolinas sewage ponds, MRN, 27 Mar 1990 molted from first basic to first alternate plumage before disappearing 30 Apr 1990 (KH†; SFB†, EDG†, JM, DR†, RFT†; 51-1990). A sketch of this bird was published in *Am. Birds* 44:386 and a photograph appeared in *Am. Birds* 44:492. Determining the age and sex of Garganeys in the field can be tenuous; Jackson (1992) provided a good summary and discussion of the useful features.

COMMON POCHARD *Aythya ferina* (1). A male at Silver Lakes, SBE, 11–17 Feb 1989 (CB, GMcC, MAP, DR†, AS†, RCS, BBS, DGY; 30-1989) was the first to be recorded in California and in continental North America outside of Alaska. Patten (1993) published a full account of this record, including a photograph. A color photograph of this bird appeared in *Am. Birds* 43:230. As do many reports of vagrant waterfowl in California, this record engendered debate about the bird's natural occurrence. The record passed 9–1 on the second round, with the lone dissenter questioning the natural occurrence.

*TUFTED DUCK *Aythya fuligula* (60). A female at Arcata, HUM, 29 Apr–4 May 1983 (SWH; 113-1992) was probably a northbound spring migrant, although birds known to be wintering have stayed as late as mid-April. The date range is that given in *Am. Birds* 37:908; Harris (1991) listed the final date as 3 May. A female was at Warm Springs, Fremont, ALA, 17 Nov 1989–4 Apr 1990 (LRF; 135-1989). Another female was observed at the Bolinas sewage ponds, MRN, 30 Dec 1989 (PP; 5-1990). A male at Mallard Reservoir in Concord, CC, 30 Dec 1989 (RJR; 54-1990) was considered the same male observed there 27 Dec 1986–10 Jan 1987 (Langham 1991) and again on 31 Dec 1988 (Pyle and McCaskie 1992). A male was at L. Hennessey, NAP, 1 Jan 1990 (JEP; BDP; 2-1990). A male visited various locations in San Francisco, SF, 9 Jan–26 Apr 1990 (AArt†, JLD, EE†, KLG, MJL, JM, GMcC; 7-1990/45-1990), including the Sutro Baths, Elk Glen L., Stowe L., and L. Merced; a photograph of it was published in *Am. Birds* 44:323. This bird was thought to be a returning individual, with the previous winter's occurrence being 19 Nov 1988–27 Mar 1989 (Pyle and McCaskie 1992). A female was at San Leandro Reg. Shoreline, ALA, 22 Jan 1990 (DeH, DaH; 53-1990). A female at Saticoy, VEN, 4 Feb–5 Mar 1989 (GMcC, MAP; 40-1989) and 21 Dec 1989–10 Mar 1990 (DD†, JLD, PEL†; 1-1990) was considered a returning individual, with the previous dates being 17 Feb–3 Mar 1985 (Dunn 1988) and 20 Feb 1986 (Bevier 1990); a photograph of it appeared in *Am. Birds* 44:328. A male at Castaic L., LA, 28 Jan 1990 (JLD, KLG; 87-1990) and again 28 Dec 1990–28 Jan 1991 (KLG; 100-1992) was considered the same as one there 4 Dec 1988 (Pyle and McCaskie 1992). A male at Pyramid Lake, LA, 28 Jan 1990 (JLD; KLG†; 88-1990) was apparently present "through February" (*Am. Birds* 44:328).

KING EIDER *Somateria spectabilis* (28). An immature male at Pt. Reyes NS ("fish docks"), MRN, 30 Aug 1989 molted into adult plumage before it was last seen on 21 Apr 1990 (GHF; JLD, KLG, EDG†, MJL, GMcC, JM, SWM, BDP, MAP, DR; 133-1989). Photographs of this bird appeared in *Am. Birds* 44:156 and 44:323.

ZONE-TAILED HAWK *Buteo albonotatus* (29). An adult was over the Oak Hill Cemetery in Escondido, SD, 30 Dec 1989 (EJM; 84-1990). An adult at Hot Springs

Mtn., SD, 20 May 1990 (GMcC; 92-1990) was considered to be one of the pair that has nested here at least from 1986 to 1988, although the Committee has not received details for the 1989 sighting reported in *Am. Birds* 43:1367–1368. Previous accepted dates for the pair are 6–12 Jul 1986, 13 Jun–7 Jul 1987 (Langham 1991), and 4 Jul 1988 (Pyle and McCaskie 1992). The Hot Springs Mtn. birds, along with a pair that nested 1979–1982 on Santa Rosa Mtn., RIV (Binford 1983, 1985, Roberson 1986), suggest that Zone-tailed Hawks may be expanding their regular breeding range into California, although four coastal San Diego Co. specimens taken between 1862 and 1932 (Unitt 1984, Roberson 1993) suggest that a small population has persisted for quite some time. We believe that the recent spate of winter records in the vicinity of Escondido may represent offspring from the Hot Springs Mtn. nesting efforts.

GYRFALCON *Falco rusticolus* (5). An immature was at Tule L. NWR, SIS/MOD, 9–25 Nov 1989 (Figure 2; BEDe; RE, JO†, RS†, ST; 125-1989). One observed just north of the Oregon border on 31 Dec 1989 presumably was the same individual, so details of it are attached to the record.

MONGOLIAN PLOVER *Charadrius mongolus* (4). One in first basic or worn juvenal plumage was at Pt. Reyes NS (near the RCA Station), MRN, 22–25 Sep 1989 (RS; AG†, MJL, JM, BDP; 132-1989). Identification of a bird in basic plumage sparked some concern about conclusively eliminating the very similar Greater Sand Plover (*C. leschenaultii*), especially since even alternate-plumaged birds have caused field identification problems (Shaw and Webb 1991). Taylor (1987) discussed a suite of features useful for separating these species in basic plumage. The Pt. Reyes bird had a small bill (about the size of that of a Snowy Plover, *C. alexandrinus*), perhaps

Figure 2. Immature Gyrfalcon (125-1989) at Tule Lake National Widlife Refuge, Siskiyou County, 14 November 1989.

Photo by Rich Stallcup

the feature most useful in separating the Greater Sand Plover. Subspecies of *C. leschenaultii* in the eastern portion of its range (nominate birds and *C. l. crassirostris*), presumably the most likely to occur in California, have bills proportionately much larger than those of any race of *C. mongolus*. Leg coloration and leg length are also useful distinctions, as the Mongolian Plover has shorter, blacker legs, the Greater Sand Plover, longer, more greenish or yellowish legs.

EURASIAN DOTTEREL *Charadrius morinellus* (4). A juvenile was on SE Farallon I., SF, 15 Sep 1989 (TS†; 166-1989); a color photograph of it was published in *Am. Birds* 44:30. All four California dotterels have occurred between 6 Sep (1986; Langham 1991) and 20 Sep (1974; Henderson 1979, Luther et al. 1979) on either SE Farallon I. or nearby Pt. Reyes, MRN.

UPLAND SANDPIPER *Bartramia longicauda* (11). A juvenile frequented the lawns of an industrial park in Ventura, VEN, 28 Aug 1989 (JLD, SEF†, PEL†, MAP; 111-1989); a color photograph of it was published in *Am. Birds* 44:30. There is now a nearly even split between spring and fall records for California, with spring ones extending from 15 to 29 May, fall ones from 22 August to 13 September.

A dried carcass, estimated at about four weeks old, was found on SE Farallon I., SF, 21 Sep 1989 (PP†, #CAS 84874; 167-1989). Thus a possible Upland Sandpiper reported on SE Farallon I. 27 Aug 1989 (Oriane Williams, *fide* Peter Pyle) may well have been the same bird.

LITTLE CURLEW *Numenius minutus* (2). One was observed with a flock of Long-billed Curlews (*N. americanus*) and a few Whimbrels (*N. phaeopus*) in agricultural fields in the Santa Maria R. valley, near Guadalupe, SBA, 23–24 Sep 1988 (JML, MJL; SFB, JLD, GMcC, MAP; 179-1988). The bird was seen fairly briefly each day, and its age was not determined. The bird was treated as likely different from the juvenile photographed and seen by many observers a few miles to the east from 16 Sep to 14 Oct 1984 (Lehman and Dunn 1985, Roberson 1986). The 1984 record was the only previous one for North America, although there is now a specimen for St. Lawrence I., Alaska, 7–8 Jun 1989 (Gibson and Kessel 1992).

HUDSONIAN GODWIT *Limosa haemastica* (8). A male in alternate plumage at Red Hill, south end of the Salton Sea, IMP, 22 May 1990 (JMa†; 93-1990) and a juvenile at the Sunnyvale sewage ponds, SCL, 1–24 Sep 1990 (WGB, MJL, JM, SWM, DEQ†, RST; 121-1990) were both county firsts.

BAR-TAILED GODWIT *Limosa lapponica* (11). An alternate-plumaged male was at Pt. Mugu, VEN, 30 Aug 1990 (BE; NBB, AS; 118-1990). A juvenile at MacKerricker SP, MEN, 26 Aug–6 Oct 1990 (DT, GM; BK, OJK, MJL†, SBT†; 122-1990) appeared typical of the Siberian subspecies *L. l. baueri*; a photograph of it appeared in *Am. Birds* 45:147. By contrast, the Pt. Mugu bird had a white rump with "few spots or streaks," a white V extending up the back, and white underwing coverts that showed "faint buffy spotting or barring." These features suggest that the bird may have been nominate *lapponica* of the western Palearctic or possibly the intermediate *menzbieri* from central Russia (Partenko 1936), a race that is not recognized by many authorities (e.g., Vaurie 1965). The described small size also pointed toward *lapponica*, although all godwit species show substantial sexual dimorphism in size, with males being much smaller than females, so size is not a useful character unless the sex of the bird is known. There are no previous records of nominate *lapponica* in western North America, although this subspecies has been recorded on the Atlantic coast from Newfoundland south to Florida (AOU 1983).

RUFOUS-NECKED STINT *Calidris ruficollis* (6). An alternate-plumaged adult was photographed at the Santa Maria R. mouth, SBA/SLO, 15 Jul 1990 (Figure 3; SEF†, PEL†, BS†; 106-1990); another photograph appeared in *Am. Birds*

44:1187. All accepted California records of this species have been of alternate-plumaged birds.

CURLEW SANDPIPER *Calidris ferruginea* (16). Juveniles were photographed at Lake Merced, SF, 17–20 Sep 1989 (JLD†, GHF, PL†, JM, SWM, MAP, RST, FT; 112-1989) and at Pt. Mugu, VEN, 26 Sep-9 Oct 1989 (BEDe; NBB, JLD, MHe†, GMcC, RJM; 144-1989). A photograph of the Lake Merced bird was published in *Am. Birds* 44:157.

*BUFF-BREASTED SANDPIPER *Tryngites subruficollis* (71). One juvenile was at Natural Bridges SP, SCZ, 28–30 Aug 1989 (DEG, CK, BoM; 138-1989). One juvenile was at Edwards AFB, KER, 16 Sep 1989 (BD†; MTH, GMcC; 188-1989), and an alternate-plumaged bird was there 3–9 Jun 1990 (MTH†; 98-1990); a color photograph of the latter appeared in *Am. Birds* 44:380. Single juveniles were at Bolinas, MRN, 15–18 Aug 1990 (SFB, BDP; 115-1990), at Abbotts Lagoon, MRN, 19 Aug 1990 (MW; 113-1990), and at Zmudowski SB, MTY, 23 Aug 1990 (DEG; 172-1990). One juvenile was distantly photographed at Moss Landing, MTY, 24 Aug–3 Sep 1990 (DEG; MJL, DR†, RST; 117-1990). Three juveniles were at Hayward Reg. Shoreline, ALA, 25 Aug 1990 (RJR; GHF, SG; 114-1990). Single juveniles were at Morro Bay, SLO, 1 Sep 1990 (EVJ; BS†; 127-1990) and at the Salinas R. mouth, MTY, 5–15 Sep 1990 (DEG; MJL†, BFM, DR†; 119-1990). A photograph of the former was published in *Am. Birds* 45:151.

With the exception of the spring bird at Edwards AFB, all of the reported individuals were juveniles. The birds at Edwards AFB were only the seventh and eighth recorded inland in California. The June bird represented only the second spring record for the state, following one for Arcata, HUM, 3–4 May 1980 (Roberson 1986, Harris 1991).

LITTLE GULL *Larus minutus* (41). Adult or second-winter birds were at Horseshoe Pond and Drakes Beach, Pt. Reyes NS, MRN, 20 Aug–25 Oct 1989 (MJL, SMl, JM, BDP; 126-1989) and near the Santa Clara R. estuary, VEN, 23–26 Nov 1989 (SEF†, BH†, PEL, GMcC, MAP; 122-1989). Adults frequented the Carpinteria Creek mouth in Carpinteria, SBA, 8–9 Jan 1990 (AB†, JLD, PEL; 43-1990) and Coyote Hills Regional Park, ALA, 3 Mar 1990 (CJ; 49-1990). A first-summer bird was at the Santa Ynez R. mouth, SBA, 7 May–14 Jun 90 (AA†, SEF, BHi†, PEL, CAM; 82-1990). Photographs of the Santa Barbara Co. individuals were published in *Am. Birds* 44:329 and 44:497, respectively.

The Pt. Reyes and Santa Clara R. estuary birds sparked a debate about determination of the age of certain individuals of this species. Both birds were described as typical adults, except their underwings showed some whitish mottling on the coverts, although the remiges were slaty black. Grant (1986) suggested that Little Gulls with white on the underwing coverts but otherwise appearing to be adults are probably in second-winter plumage. Nevertheless, the primaries of both of these birds lacked dark tips, which second-winter individuals are believed generally to show.

THICK-BILLED MURRE *Uria lomvia* (25). Six were in the Monterey and Pacific Grove area, MTY, 8 Sep 1989–9 Apr 1990 (RLB†, JLD†, SEF†, MJL, GMcC, SWM, MAP, DR, MMT†, FT, BJW; 113-1989). More precisely, one bird was present 8 Sep, the count peaked at six on 19 Sep, three were present until at least 15 Oct, two stayed until 11 Feb, and one lingered until 9 Apr. In *Am. Birds* 44:157 (which includes a photograph of one of these birds) a maximum of only five was reported. A basic-plumaged bird frequented Moss Landing Harbor, MTY, 1–26 Jan 1990 (BS; JLD, KLG, GMcC; 3-1990). This influx of seven Thick-billed Murres into Monterey Bay was the largest on record, barely surpassing the five found there 11 Aug 1974–22 Feb 1975 (Luther et al. 1979, Roberson 1985, 1993). All but one of the 25 accepted California records have come from Monterey Bay and vicinity.

PARAKEET AUKLET *Cyclorrhynchus psittacula* (33). One was found dead 1 mi. south of the Santa Ynez R. mouth, SBA, 4 Jul 1988 (RPH; 152-1988). The carcass was photographed then prepared as skin and skeleton (#SBMNH 5423).

Beach-washed corpses have long caused problems for students of bird distribution (see Grinnell 1938). Paul W. Collins and Mark A. Holmgren, who examined and prepared the specimen, opined that the carcass, still in fairly good condition when it was recovered, had floated at sea for approximately seven to ten days prior to washing ashore. Nine Committee members agreed that this individual most likely died within California waters, though such issues are impossible to resolve with certainty.

RUDDY GROUND-DOVE *Columbina talpacoti* (17). One "male" in the Tijuana R. valley (Myers Ranch), SD, 12–20 Oct 1988 (GMcC; 220-1988B), a male there 14–31 Oct 1989 (GMcC, MAP; 152-1989), and a female there 18–31 Oct 1989 (GMcC; 153-1989) are the first to be accepted from coastal California, the natural occurrence of one 24–26 Nov 1978 at Fillmore, VEN, having been questioned (Binford 1985). Even current coastal reports caused concern among some Committee members, who cited Goodwin (1983), Clinton-Eitniear (1989), and other sources indicating that the species is kept commonly in captivity. They noted that the Ruddy Ground-Dove had not then occurred in Baja California (but see below), decreasing the chances of the species appearing in south-coastal California.

Nevertheless, aviculturalist Jack Clinton-Eitniear stated (*in litt.*) that "it is very doubtful that sightings of the Ruddy Ground-Dove [are] due to cagebirds escaped from aviculturists." Furthermore, Luis Santaella (*in litt.*) could not find this species in a check of *mercados* in Monterrey, Nuevo Leon, in March 1991. There are two recent reports of Ruddy Ground-Doves in Baja California Sur, of one observed southeast of San Antonio, 23 Nov 1990 (John O'Brien, *fide* Kurt Radamaker) and a male seen at San José del Cabo, 11 Jun 1991 (Howell and Webb 1992). The species has been recorded with increasing frequency in interior California and Arizona, and, to a lesser extent, New Mexico and Texas. The Committee therefore felt that the balance of evidence suggested that even the birds in coastal San Diego Co. were likely of natural occurrence, especially because the timing of the records coincided with that of records for southeastern California.

A male frequented Furnace Creek Ranch, INY, 17 Oct 1989–7 Apr 1990 (NBB, HB, DFD, JLD†, GMcC, MAP, BP; 118-1990), then was joined by a second male from 29 Oct 1989 to 1 Apr 1990 (HB; GMcC, MAP, BP; 150-1990). A female was at Furnace Creek Ranch 21–29 Oct 1989 (MAP; HB, JLD, GMcC; 119-1989). Two males at Bard, IMP, 25 Nov–2 Dec 1989 (GMcC; 191/192-1990) were the first to be recorded in that county, although one reported on the Martinez Lake–Yuma, Arizona, Christmas Bird Count on 17 Dec 1988 (*Am. Birds* 43:1098) is rumored to have been in Bard. The Committee has not reviewed that record.

Despite the excellent identification treatise by Dunn and Garrett (1990), sexing Ruddy Ground-Doves in the field has proved at times to be quite difficult. At MLZ, Patten examined a series of 29 skins of *C. t. eluta* (the subspecies from west Mexico that presumably accounts for all California records). Birds showing obvious ruddy or chestnut proved to be males, whereas birds that were wholly or mostly gray were females. Seven skins, however, were intermediate between these extremes, two of which were labeled female and five of which were labeled male. One of the females (MLZ 43344), collected in Guerrero on 10 Jun 1944, was brighter than four of the males in the collection. Examination by Patten of an additional 39 skins at WFVZ showed a similar pattern of intersexual plumage overlap. One female with gonad data on the tag (WFVZ 22894), collected 17 Jul 1972 in Costa Rica and thus likely *C. t. rufipennis*, was distinctly brighter than many males collected in the same area. Thus observers may not be able to sex all Ruddy Ground Doves in the field. The

coloration of the tips of the outermost rectrices may prove useful. In fresh plumage, the tips are white on females, buff on males (Dunn and Garrett 1990). Unfortunately, this difference is extremely difficult to distinguish in the field, where the tips of all fresh rectrices look basically "white" or "pale."

BLACK-BILLED CUCKOO *Coccyzus erythropthalmus* (13). An immature was in Huntington Beach, ORA, 4–6 Oct 1989 (JEP; JLD†, LRH†, GMcC, MAP; 146-1990). This record was only the third for the southern half of the state, following single birds observed at Big Sycamore Canyon SP, VEN, on 24 Sep 1974 (Binford 1985) and photographed at the Brock Research Center, IMP, 12–13 Sep 1981 (Binford 1985).

*BARRED OWL *Strix varia* (6). One at Tule Lake NWR, SIS, 15 Dec 1987–23 Jan 1988 (RE; 126-1990) was judged to be the same individual photographed at the same location 28 Nov 1986–21 Feb 1987 (Langham 1991).

RED-HEADED WOODPECKER *Melanerpes erythrocephalus* (4). One found dead on the road on what is now the border between the cities of La Puente and West Covina, LA, 20 May 1962 (#CSULB 2955; 79-1990) represents the first California record. The possibility that this bird did not arrive naturally in California was first considered by Marqua (1963) in his original note. This notion was amplified by McCaskie et al. (1970) when they omitted the species from the state list. The record has generally been considered questionable ever since (Roberson 1980, Garrett and Dunn 1981, 1989). But examination of the specimen by Stephen F. Bailey, further analysis of particulars of the record by Kimball L. Garrett, and three subsequent Red-headed Woodpecker records for California (Pyle and McCaskie 1992) prompted unanimous support on the second circulation.

GREATER PEWEE *Contopus pertinax* (24). One was in Malibu, LA, 10–16 Dec 1989 (KLG†; 8-1990). One on the grounds of the San Diego Zoo, Balboa Park, San Diego, SD, 16 Dec 1989–1 Mar 1990 (DH; GMcC; 12-1990) was back for its third winter at that locality. Previous dates were 20 Feb–30 Mar 1988 and 6 Dec 1988–15 Feb 1989 (Pyle and McCaskie 1992). These records fit the recent pattern of Greater Pewees wintering along the coast. The Malibu bird may have been a tardy fall migrant, however, as it could not be found subsequently.

YELLOW-BELLIED FLYCATCHER *Empidonax flaviventris* (6). One at Galileo Hill Park, KER, 27 Sep–1 Oct 1989 (JLD†; NBB, MOC, NeH†, MTH†, PEL†, GMcC, MAP, LaS†, JCW; 114-1989) was widely seen, and *heard*, furnishing only the second mainland record for California; a color photograph was printed in *Am. Birds* 44:30. An immature banded and measured at SE Farallon I., SF, 8–9 Sep 1989 (PP†; 168-1989) was more representative of previous records.

Characters used to identify the Galileo bird included the shortish bill and tail, rounded head, circular yellowish-white eye rings, blackish wings with yellowish-white wingbars, extensive yellow onto the throat, the absence of brownish tones, and, most importantly, a call like that of the Black Phoebe (*Sayornis nigricans*). See also comments under Records Not Accepted. DeSante et al. (1985) and Pyle and McCaskie (1992) discussed the identification of previous California Yellow-bellied Flycatchers.

DUSKY-CAPPED FLYCATCHER *Myiarchus tuberculifer* (16). One was at Pine Lake Park, San Francisco, SF, 28 Dec 1989–20 May 1990 (DPM, DSi; JLD, KLG, MJL, GMcC, JM, SWM; 4-1990). The final date matches the record late date for this species, established by a wintering bird in Los Osos, SLO, in 1984 (Roberson 1986).

Any *Myiarchus* found in California in winter should be carefully identied, as the number of Ash-throated Flycatcher (*M. cinerascens*) records in many areas are comparable to those of the Dusky-capped. Although not the only difference, tail

Figure 3. Alternate-plumaged Rufous-necked Stint (106-1990) at the mouth of the Santa Maria River, Santa Barbara County, 15 July 1990. Gray fringes to the tertials and greater coverts, the unstreaked rufous face, the rufous throat, and the band of streaks below the rufous breast distinguish the Rufous-necked from the Little Stint.

Photo by Shawneen E. Finnegan

Figure 4. California's first Cave Swallow (30-1990) near Calipatria, Imperial County, 8 August 1987. See the text for a discussion of the identification of this bird.

Photo by John O'Brien

pattern is probably the visual character most easily used in distinguishing these species. Typical Dusky-capped Flycatchers in California show rufous edges on the outer webs of the rectrices, especially toward the base, so that rufous is visible from above, even with the tail tightly closed. No rufous is visible on the underside of the tail. In contrast, the rectrices of adult Ash-throated Flycatchers (and other North American congeners) are extensively rufous on the inner webs, so that the tail appears primarily rufous from below. The outer webs of the rectrices are dark, however, so the tail shows no rufous from above, unless the tail is spread. Beware of juveniles of these species, however, which have rufous edges on the outer, as well as the inner, webs of the rectrices.

GREAT CRESTED FLYCATCHER *Myiarchus crinitus* (33). An immature female was collected at Harper Dry Lake, SBE, 4 Sep 1988 (CMcG; #SBCM 52075; 208-1990), one was at Galileo Hill Park, KER, 23–27 Sep 1989 (JCW, MTH†; JLD, MAP; 115-1989), and an immature (probably male) was banded and measured on SE Farallon I., SF, 27 Sep 1989 (PP†; 169-1989).

Previous California records, one third from SE Farallon I., are all from coastal areas in the period 5 September–1 November. Thus the Farallon bird is typical, but the others are the first accepted inland records, and the specimen represents the earliest record ever. Its skull was already 100% ossified, despite the young age of the bird, clearly established by the bilobed bursa of Fabricius. Pyle et al. (1987) suggested 15 September as an early date for complete ossification, even in southern populations, with 15 October being more typical.

THICK-BILLED KINGBIRD *Tyrannus crassirostris* (8). One in Peters Canyon, Tustin, ORA, 24 Nov 1989–6 Apr 1990 (PE, BHu, MJL, DR, JW; 204-1989) is considered the same wintering individual recorded annually since its initial discovery 19 Dec 1982. Previous accepted dates of occurrence are 19 Dec 1982–9 Apr 1983 (Morlan 1985), 26 Nov 1983–3 Jan 1984, 26 Oct 1985–9 Mar 1986 (Bevier 1990), 4 Nov 1987–5 Mar 1988, and 29 Nov 1988–5 Mar 1989 (Pyle and McCaskie 1992). The winter visits of 1984–1985 (8 Nov–6 Apr; *Am. Birds* 39:103 and 39:350) and 1986–1987 (9 Nov–1 Mar; *Am. Birds* 41:331) have not been reviewed by the Committee.

SCISSOR-TAILED FLYCATCHER *Tyrannus forficatus* (64). Single birds were found at the following locations: 10 mi. east of Gasquet, DN, 27 May 1988 (RLM; 112-1990); Gualala Pt. Co. Park, SON, 4–6 Jun 1989 (BPe†; 72-1990); Pt. Reyes NS, MRN, 28 May–10 Jun 1989 (LS; ALE; 34-1990); Pt. Pinos, Pacific Grove, MTY, 8 May 1990 (RRR; DR†; 64-1990); and Crystal Cove SP, ORA, 6–7 Aug 1989 (LAS; 103-1990). There are now 28 accepted records for the months of May and June, the peak period of occurrence for this species in California.

CAVE SWALLOW *Hirundo fulva* (1). A previously unpublished report of one west of Calipatria, IMP, 8 Aug 1987 (Figure 4; JO'B†; 30-1990) is California's first record. The initial response to this report in 1987 was cool. Other observers were unable to relocate the bird later in the day among thousands of migrant Tree (*Tachycineta bicolor*) and Cliff (*H. pyrrhonota*) swallows, and O'Brien was apparently convinced by others that the bird might merely have been a juvenile Cliff Swallow. Thus it came as a surprise when O'Brien submitted photographs of the bird to the Committee in March 1990, after he had studied and photographed Cave Swallows in Texas and regained confidence in his original identification. The record received some resistance in its first circulation concerning basic identification criteria and the "sudden" appearance of photographs nearly three years after the fact. The record received unanimous support on its second round.

Because Cliff Swallows breeding in southeastern Arizona and much of Mexico, variously referred to as *minima* (AOU 1957), *melanogaster* (Phillips et al. 1964), or

swainsoni (Phillips 1986), have chestnut foreheads like the Cave Swallow, some Committee members expressed concern that some light-throated immatures of this subspecies of the Cliff Swallow might match the Cave Swallow. On the basis of correspondence from Greg W. Lasley and an examination of a series of specimens at LACM by Kimball L. Garrett and Jon L. Dunn, however, it appears that young Cliff Swallows show neither the clear cinnamon-buff throat, upper breast, and face nor the blackish eye patch exhibited by the Calipatria bird, and typical of Cave Swallows.

This species was anticipated in California. Cave Swallows have been expanding their range in the southwestern United States in recent years and nested as close as Tucson from 1983 to 1985 (Huels 1984, Am. Birds 39:948).

RED-FLANKED BLUETAIL *Tarsiger cyanurus* (1). An immature banded and measured on SE Farallon I., SF, 1 Nov 1989 (Figure 5; DBe†, SDE†; 172-1989) was California's first, and further evidence that we have only begun to tap the pool of Asiatic landbirds that will appear in the coming years. A color photograph was printed in *Am. Birds* 44:29. All previous North American records have come from the islands of western Alaska in spring: single birds on Attu on 5 Jun 1982 and St. Paul on 10 Jun 1987, and up to four on Attu from 22 May to 6 Jun 1988 (Gibson and Kessel 1992). The identification of this species is straightforward and well covered in the Old World literature (e.g., Lewington et al. 1991).

GRAY-CHEEKED THRUSH *Catharus minimus* (13). One was at Galileo Hill Park, KER, 14–18 Sep 1989 (JB; MOC, JLD, MTH†, GMcC, JCW; 136-1989); a

Figure 5. Immature Red-flanked Bluetail (172-1989) on Southeast Farallon Island, San Francisco County, 1 November 1989; a California first. A color photograph of this bird was published in *American Birds* 44:29. The distinctive throat pattern is not shared by any North American passerine, but it is typical of several small Old World thrushes.

Photo by David Beadle

photograph was published in *Am. Birds* 44:163. All previous records have come from three well-covered coastal locations: SE Farallon I., SF (8), Pt. Reyes NS, MRN (2), and Pt. Loma, SD (2).

RUFOUS-BACKED ROBIN *Turdus rufopalliatus* (6). One at Desert Center, RIV, 24–26 Nov 1989 (GMcC; SEF†, PEL, MAP; 120-1989) was the first to be found in California in six years. A photograph was published in *Am. Birds* 44:163. All California records have been for late fall and winter, fitting the pattern of most records in Arizona (Monson and Phillips 1981).

CURVE-BILLED THRASHER *Toxostoma curvirostre* (13). One was in Brawley, IMP, 21 Jan–3 Mar 1990 (JLD, MJL, CAM†, GMcC, MAP; 28-1990). The geographic distribution of previous California records (*all* from Imperial Co.) is as consistent as the historic pattern is not: five records from 1916 to 1925 and seven records from 1973 to 1980. The "same/returning bird theory" cannot be applied because the first five were all collected and the recent birds were dispersed over five localities.

*RED-THROATED PIPIT *Anthus cervinus* (66). Two were in Goleta, SBA, 17–25 Oct, with one remaining to 27 Oct, 1988 (JLD; 244-1988), and single birds were on SE Farallon I., SF, 27 Sep 1989 (PP, TS; 170-1989) and 14 Oct 1989 (DBe, PP†; 171-1989). All previously accepted California records fall between 9 September and 15 November (Langham 1991, *contra* Pyle and McCaskie 1992), with the vast majority being coastal.

Figure 6. Cassin's Sparrow (54-1989) in Miguelito Canyon, near Lompoc, Santa Barbara County, 9 May 1987. The dark flank streaks and graduated tail, with whitish tips and outer webs to the outer rectrices, identified this bird.

Photo by Alex Abela

SPRAGUE'S PIPIT *Anthus spragueii* (21). One near Lakeview, RIV, 3 Nov 1987–10 Jan 1988 (CAM, GMcC, MAP; #SBCM 52557; 301-1987) and another at Plano Trabuco, ORA, 2 Dec 1989–19 Feb 1990 (BED; JLD, MTH†, GMcC, MAP; 123-1989) are the fourth and fifth winter records for California. McCaskie's (1988) implication that a second bird was near Lakeview the Committee judged a probable error. The Plano Trabuco bird was the first to be found in Orange Co..

YELLOW-THROATED VIREO *Vireo flavifrons* (37). One was on lower Gazos Creek, SM, 3 Jun 1990 (RST; 109-1990), and a singing male was near Gypsum Canyon, Anaheim, ORA, 17 May 1990 (RAE; 76-1990). The former was a first county record, the latter, a *sixth*.

PHILADELPHIA VIREO *Vireo philadelphicus* (76). Single birds were at Pt. Reyes NS, MRN, 7–8 Oct 1988 (DAH, KH; 261-1988), on SE Farallon I., SF, 6 Jun 1989 (GEW†; 173-1989) and 25 Oct 1989 (PP†; 174-1989), near Oxnard, VEN, 3–10 Oct 1989 (MHe†; JLD, PEL; 203-1989), and in Huntington Central Park, Huntington Beach, ORA, 15–16 Oct 1989 (DRW; JLD, LRH†; 147-1989). The June Farallon bird is only the tenth to be recorded in California in spring; the others fit well within the established fall pattern, as 84% of California's Philadelphia Vireos have occurred between 14 September and 9 November.

YELLOW-GREEN VIREO *Vireo flavoviridis* (27). One was collected at Harper Dry Lake, SBE, 2 Oct 1988 (#SBCM 52625; 209-1990), and an immature was banded and measured at the marina in Morro Bay SP, SLO, 14 Oct 1989 (GPS†; 16-1990). The former is the first inland record accepted by the Committee. California's

Figure 7. California's first Smith's Longspur (120-1990) at the Moonglow Dairy, Moss Landing, Monterey County, 15 September 1990.

Photo by Kurt Radamaker

first Yellow-Green Vireo was collected near Riverside, RIV, 29 Sep 1887 (Price 1888, Ridgway 1904), but the specimen has apparently been lost (Roberson 1993).

BLUE-WINGED WARBLER *Vermivora pinus* (11). One was at Trinidad SB, HUM, 27 Jun 1989 (GSL; 58-1990), and one was in Morongo Valley, SBE, 1 Oct 1989 (MAP; 116-1989). Spring and fall records for the state remain about evenly divided. The only Blue-winged Warbler previously accepted for northern California was at Bridgeport Reservoir, MNO, 18 Jun 1984 (Dunn 1988).

GOLDEN-WINGED WARBLER *Vermivora chrysoptera* (37). One was found dead in Claremont, LA, *18* Dec 1972 (uncataloged specimen at Pomona College; 206-1990). This record was the fifth for California and the first December record accepted by the Committee. Two November records are also from Los Angeles Co., a December record from San Diego Co. was recently accepted, and a February–March record from Orange Co. is currently under review. Other winter records for this species at relatively high latitudes come from Arizona (*Am. Birds* 44:304) and England (Doherty 1992).

YELLOW-THROATED WARBLER *Dendroica dominica* (59). One showing characters of the western race *albilora* was at Leoni Meadows Camp, near Grizzly Flats, ED, 28 Oct–25 Nov 1989 (HMR; 137-1989). This record is exceptional for the high elevation (ca. 1250 m; first for the Sierra Nevada) and the long and late date span (only four previous November records, plus three winter records).

GRACE'S WARBLER *Dendroica graciae* (23). One on Pt. Loma, SD, 23–24 Sep 1989 (CGE; GMcC, MAP; 189-1989) was quickly followed by another there 27–29 Sep 1989 (DWA, DP; CGE; 194-1989). In fall, there are now nine records for San Diego Co. and only two for the rest of the state.

PINE WARBLER *Dendroica pinus* (37). A male at Yorba Regional Park, Anaheim, ORA, 14 Jan–2 Apr 1989 (MTH; JLD, GMcC, MAP, JCW†; 27-1989) was the seventh clearly overwintering bird in California (two additional December records); it was the first recorded in Orange Co. The recent surge in sightings (there were only eight records for the state prior to 1983) is apparently no coincidence. Böhning-Gaese et al. (1993) demonstrated a significant recent population increase in this species.

*PROTHONOTARY WARBLER *Protonotaria citrea* (93). One was collected at Harper Dry Lake, SBE, 9 Oct 1987 (#SBCM 51702; 207-1990), and seven were documented in fall 1989: La Jolla, SD, 1 Sep (#SDNHM 46026; 99-1992); Mojave, KER, 12–16 Sep (GMcC; 187-1989); Carpinteria, SBA, 15–27 Sep (SEF†; MOC; 158-1989); Westminster, ORA, 27–29 Sep (DRW; JLD; 40-1990); 3 mi. south of Half Moon Bay, SM, 29–30 Sep (PJM; SEF, RST; 159-1989); Oceano, SLO, 30 Sep–4 Oct (SEF, GMcC; 160-1989); and SE Farallon I., SF, 23 Oct (PP†; 175-1989). Records of this species more than tripled in the 1980s, with about 75% being for fall migration.

WORM-EATING WARBLER *Helmitheros vermivorus* (57). One was in Coronado, SD, 22 Sep 1988 (EC; 196-1989), one was at Pescadero, SM, 2–14 Jan 1989 (JM, RST; 34-1989), one was at Pt. Reyes NS, MRN, 4 Nov 1989 (JM; 131-1989), and a singing male was at Mojave, KER, 25 May 1990 (JCW; JLD, SEF, MTH†, PEL; 83-1990). There have been only seven previous winter records (excluding possible late-fall migrants recorded in December) and 12 previous spring records, plus two potentially summering birds: Fort Piute, SBE, 23 Jun–10 Jul 1977 (Luther 1980), and Tilden Regional Park, CC, 11–21 Jul 1978 (Luther et al. 1983).

LOUISIANA WATERTHRUSH *Seiurus motacilla* (4). One was in La Jolla, SD, 9 Feb–21 Mar 1990 (JO'B; MTH, MJL, GMcC, AM†, MAP, DR; 29-1990), and a

singing male was in Mojave, KER, 21 May 1990 (CAM; NBB, MOC, JLD†, MTH†, MAP, JCW; 85-1990). Photographs of these birds appeared in *Am. Birds* 44:221 (color) and 44:498, respectively. With only two August records from the California deserts, two individuals within several months was exceptional. Given the species' winter status in western Mexico (regular) and southeastern Arizona (nearly annual), many had predicted a winter record for California.

KENTUCKY WARBLER *Oporornis formosus* (53). One was in Mojave, KER, 9 Jun 1990 (MTH; 110-1990). The locals have not dubbed this species the "Kerntucky" Warbler for nothing; six of the last 17 California records (nine total through 1990, plus eight records since) have come from Kern Co..

CONNECTICUT WARBLER *Oporornis agilis* (55). Single birds were at Lanphere Dunes, west of Arcata, HUM, 9–16 Sep 1988 (JCS; ADB†, GSL; 265-1988), Fairhaven, HUM, 13 Sep 1989 (JCS; RAE; 37-1990), and the Mad River mouth, HUM, 27–28 Sep 1989 (JCS; SWH; 38-1990). Four were found on SE Farallon I., SF, as follows: 13 Sep 1989 (TS; 181-1989), 28–29 Sep 1989 (banded and measured, DBe, PP†; 182-1989), 11 Oct 1989 (banded and measured, PP†; 183-1989), and 16 Jun 1990 (SDE, PP; 90-1990). The last is California's fifth June record; *all* other records are from September and, to a lesser degree, October.

MOURNING WARBLER *Oporornis philadelphia* (68). One lingered in Huntington Central Park, Huntington Beach, ORA, 5–20 Sep 1988 (DRW; MTH, MAP; 255-1988), one was at Montaña de Oro SP, SLO, 23–27 Sep 1989 (MHe†; TME, SEF, KAH; 19-1990), a male was in Mojave, KER, 20 May 1990 (MAP; RAE; 77-1990), and five were documented on SE Farallon I., SF, in fall 1989: adult male banded and measured 6–9 Sep (PP†; 176-1989), immature, probably female, banded and measured 6–8 Sep (PP†; 177-1989), immature, probably male, 8 Sep (PP; 178-1989), immature, probably female, 9 Sep (PP; 179-1989), and an immature male banded and measured 20 Sep (PP†; 180-1989). The adult male was the first for California in fall. As for the preceding species, September is *the* month for the Mourning Warbler in California; nearly 60% of all accepted birds have been seen in that month. Pyle and Henderson's (1990) identification summary is especially helpful for identifying such fall birds.

RED-FACED WARBLER *Cardellina rubrifrons* (8). One in Carruthers Canyon, New York Mountains, SBE, 13 May 1990 (ES; 96-1990) was the first found in California since 1982. This species of montane fir, pine, and oak (AOU 1983) was in an area where it could breed, as Carruthers Canyon harbors a grove of Canyon Live Oak (*Quercus chrysolepis*).

SCARLET TANAGER *Piranga olivacea* (72). One was in Huntington Central Park, Huntington Beach, ORA, 10 Nov 1989 (DRW; 41-1990), and a male was at Pt. Reyes NS, MRN, 19 Jun 1990 (HD; 94-1990). There are more records for November (25) than for any other month.

PAINTED BUNTING *Passerina ciris* (32). Single birds were at Montaña de Oro SP, SLO, 29 Sep 1988 (GH, NH†; 32-1989), Carpinteria, SBA, 15 Sep 1989 (SEF; 156-1989), and Los Osos, SLO, 18–25 Nov 1989 (MC; PP†; 186-1989). Santa Barbara (7) and San Diego (10) counties are responsible for more than half of all accepted records.

CASSIN'S SPARROW *Aimophila cassinii* (34). One in Miguelito Canyon, near Lompoc, SBA, 9 May 1987 (Figure 6; AA†; 54-1989) represents the first record for that county and is previously unpublished. The bird was originally identified as a Brewer's Sparrow, in part because of its "varied, 'bubbling'" song, unlike the typical Cassin's song. Kaufman (1990) described an alternate Cassin's Sparrow song, which Paul E. Lehman (*in litt.*) heard from a number of birds in Colorado in June 1990.

Lehman and Jon L. Dunn were the first to identify the photograph as this species and forward the details to the CBRC. The Committee unanimously concurred with the identification.

FIELD SPARROW *Spizella pusilla* (2). One at Irvine Regional Park, ORA, 25 Nov 1989–6 Jan 1990 (JKA†, JLD, KLG, EDG†, PEL, MJL, GMcC, MAP, DR; 121-1989) could not be found between 11 Dec and 4 Jan, despite much searching. The bird showed relatively little warm coloration on the face and underparts, suggesting the expected western race *arenacea*. The only previous accepted record is of one banded on SE Farallon I., SF, 17 Jun–9 Jul 1969 (Robert 1971, Roberson 1986).

LE CONTE'S SPARROW *Ammodramus leconteii* (18). Four were documented in the fall of 1989. A juvenile was banded and measured on SE Farallon I., SF, 7 Oct (PP†; 184-1989), one was at China Lake Naval Weapons Center, KER, 5 Nov (DVB; 22-1990), and two were at Furnace Creek, Death Valley NM, INY, one 17–18 Oct (NBB, JLD†; 145-1989) and a juvenile 18 Oct (JLD†; NBB; 213-1989), the first California record of this plumage away from SE Farallon I. A color photograph of the Furnace Creek juvenile was published by Pyle and Sibley (1992), who discussed in detail the juvenal plumage of this and other *Ammodramus* sparrows. This was the best annual showing since 1974, when four of California's first five Le Conte's Sparrows were noted within one month.

SMITH'S LONGSPUR *Calcarius pictus* (1). An immature male at Moonglow Dairy, Moss Landing, MTY, 13–18 Sep 1990 (Figure 7; DEG; JA, JLD, PEL†, MJL,

Figure 8. California's controversial Oriental Greenfinch (450-1986) at Arcata, Humboldt County, winter 1986/1987.

Photo by J. Mark Higley

JM, GMcC, JO'B†, BDP, MAP, KR†, DR†, BJW; 120-1990) was the long-anticipated first for California. The bird was especially welcome for the many observers who saw the Pt. Reyes Eurasian Skylark (*Alauda arvensis*) during its initial misidentification as this species (see Morlan and Erickson 1983). From the amount of white on its lesser and median secondary coverts, supercilium, and underwing coverts the bird was a male; from its tapered rectrices, lack of black in the face, and relatively drab overall coloration it was an immature (see Pyle et al. 1987). A small photograph of it was published in *Am. Birds* 45:149.

SNOW BUNTING *Plectrophenax nivalis* (40). Five were reported in fall 1989 (*Am. Birds* 44:159). Three coastal records are detailed here; two inland ones are still under review. Single birds were at Arcata Marsh, HUM, 29 Oct–1 Nov (immature female; JMH†; 46-1990), SE Farallon I., SF, 15 Nov (SA; 185-1989), and the Tunitas Creek mouth, SM, 3–4 Nov (immature male; RST†; 9-1990). The last bird was the first for San Mateo Co..

COMMON GRACKLE *Quiscalus quiscula* (22). One at Indian Ranch, Panamint Valley, INY, 12 Nov 1989 (HB; 151-1989) furnished the *ninth* record for Inyo Co. but only the sixth for the state in fall.

RECORDS NOT ACCEPTED, identification questionable

YELLOW-BILLED LOON *Gavia adamsii*. One at Ballena Bay, Alameda, ALA, 3–5 Dec 1971 (254-1987) was published, with a rudimentary description, in *The Gull* (newsletter of the Golden Gate Audubon Society) 54:12. The identification rested on a "large straw-colored bill with upturned lower mandible and straight upper mandible." A majority of the Committee felt that this description was enough, but the record failed 7–3 on the fourth (and final) circulation, despite the bird's being seen by a long-standing CBRC member. This record was accepted by Remsen and Binford (1975). Identification of this species should not rely solely on bill coloration; see Binford and Remsen (1974) and Phillips (1990) for more information.

Details were judged to be insufficient for one reported at Shelter Cove, HUM, 21 Oct 1988 (266-1988), which would have been the second-earliest Yellow-billed Loon to reach California in fall, although at least two have "summered" in the state.

SOLANDER'S PETREL *Pterodroma solandri*. "On the order of 100" reported offshore from Pt. Reyes, MRN, to Pt. Pinos, MTY, 10–21 Apr 1987 (98-1987) lacked detail sufficient to rule out Murphy's Petrel (*P. ultima*), which has proved to be *the* dark *Pterodroma* off California, especially in spring. The description did not clearly indicate Murphy's Petrel, although the Committee unanimously agreed that one of these two species, probably Murphy's, was involved in this sighting. Solander's Petrel is yet unproven from California waters, although the species is apparently regular off Japan May–August (Nakamura and Tanaka 1977, Wahl 1978). One collected in the North Pacific Ocean within 1400 mi. of California at 40°N, 150°W on 10 Jul 1985 (#LACM 102806) and various sight reports nearer the state (Bailey et al. 1989b) suggest that this species may reach California waters.

WEDGE-TAILED SHEARWATER *Puffinus pacificus*. Descriptions of dark shearwaters seen at 33°57' N, 118°48' W, 61 nmi. west of Pt. Dume, LA, 12 Nov 1989 (163-1989) and at 34°42' N, 121°35' W, 48 nmi. west of Pt. Arguello, SBA, 19 Nov 1989 (164-1989), reported as possibly this species, lacked detail sufficient to eliminate the Flesh-footed Shearwater (*P. carneipes*).

RECORDS NOT ACCEPTED, identification questionable, Cont.

TOWNSEND'S SHEARWATER *Puffinus auricularis*. The Committee felt that a bird briefly seen on Monterey Bay, MTY, 6 Oct 1990 (147-1990) was more likely a Black-vented Shearwater (*P. opisthomelas*), a species whose range of variation is not appreciated by many observers. Occasional Black-vented Shearwaters can have white wrapping up onto the sides of the rump, as on Townsend's Shearwater (P. Pyle *in litt.*).

BAND-RUMPED STORM-PETREL *Oceanodroma castro*. One reported at 30°52' N, 121°33' W, 177 nmi. SSW of San Nicolas I., VEN, 8 Nov 1989 (165-1989) lacked documentation adequate to support a record of this difficult-to-identify species.

WEDGE-RUMPED STORM-PETREL *Oceanodroma tethys*. A report of one roughly 200 nmi. SSW of San Nicolas I., VEN, 13 Aug 1988 (209-1989) was supported by inconclusive details.

BROWN BOOBY *Sula leucogaster*. The description of one reported off Pyramid Pt., San Clemente I., LA, 13 May 1989 (195-1989) includes several features, such as "pale brown streaking on [a] white background . . . confined to the breast area," suggesting a first-year Masked Booby (*S. dactylatra*). The Brown Booby shows a brown breast concolor with the upperparts. The Masked can show a somewhat similar pattern (see Figure 1), but white is suffused or intrudes into the brown, the brown does not extend as far down the breast as on a Brown Booby, and the division between the brown and the white is less clean-cut. The Committee unanimously agreed that the sighting involved a booby.

ANHINGA *Anhinga anhinga*. One was reported at Laguna Dam, IMP, 14 Nov 1981 (159-1988).

REDDISH EGRET *Egretta rufescens*. A white-morph bird was reported at Elkhorn Slough, Moss Landing, MTY, 8 Oct 1989 (193-1989). The account indicates that the bird was "dancing" like a Reddish Egret, but aside from the "thicker bill," which was all black, the Committee felt that not enough detail was presented for what would be the first record for California or Baja California of a white-morph bird (*contra* Cogswell 1977).

TRUMPETER SWAN *Cygnus buccinator*. Immatures observed at L. Almanor, PLU, 29 Dec 1988 (200-1989) and photographed 5 mi. south of Talmage, MEN, 23 Dec 1989 (60-1990) were identified as this species. The former record was published in *Am. Birds* 43:362. Details suggested that both birds were in fact immature Tundra Swans, or at least that species could not be eliminated. The initial identification of each individual was based in part on the flat profile (culmen and forehead) of the birds, a feature often associated with the Trumpeter Swan. Bailey (1991), however, indicated that immatures of both species have a flat culmen and that this feature cannot be used to separate immature Trumpeter and Tundra swans in the field.

*TUFTED DUCK *Aythya fuligula*. A report of a male at Cape Mendocino, HUM, 23 Feb 1980 (326-1986) was published in *Am. Birds* 34:303 and by Harris (1991). The record was not accepted on the fourth and final circulation because a minority of the Committee (two members) felt that the details were not complete enough even for this now annual vagrant. A male at San Pablo Reservoir, CC, 15 Jan 1990 (55-1990) lacked a complete description; this bird was one of six that were said to have wintered in the greater San Francisco Bay area in 1989/1990 (*Am. Birds* 44:323).

RECORDS NOT ACCEPTED, identification questionable, Cont.

COMMON BLACK-HAWK *Buteogallus anthracinus*. One was reported at Border Field SP in the Tijuana R. valley, SD, 3 Oct 1989 (11-1990). The brief description did not rule out an immature Golden Eagle (*Aquila chrysaetos*) or a dark-morph Broad-winged Hawk (*Buteo platypterus*). There is still but one accepted California record of this species (Roberson 1986, Daniels et al. 1989).

YELLOW RAIL *Coturnicops noveboracensis*. A sight record of one flushed at the north spit of Humboldt Bay, HUM, 10 Oct 1978 (114-1992) was considered "satisfactory" by Harris (1991). Nevertheless, upon review of the meager documentation, the Committee disagreed.

CARIBBEAN COOT *Fulica caribaea*. A brief descripiton of one at Buena Vista Lagoon, SD, 12 Mar 1987 (129-1991) was published by Komito (1990). This prospective first record for California was unanimously rejected on the first round. American Coots (*F. americana*) with extensive white shields have been previously reported in California many times (Roberson and Baptista 1988), hindering the identifying of a Caribbean Coot in the field. Indeed, identification difficulties recently prompted the American Birding Association to remove the Caribbean Coot from its checklist of North American birds (DeBenedictis et al. 1992), and the taxonomic distinctness of the species has been questioned (AOU 1983, Sibley and Monroe 1990).

PIPING PLOVER *Charadrius melodus*. An intriguing plover with "orangey-yellow legs" was briefly seen at Abbotts Lagoon, Pt. Reyes NS, MRN, 5 Aug 1989 (128-1989). Several members noted that juvenile Snowy Plovers (*C. alexandrinus*) can have yellow legs, so leg color alone was not conclusive. The details contained no information regarding the bill shape.

AMERICAN OYSTERCATCHER *Haematopus palliatus*. An oystercatcher on Santa Cruz I., SBA, 23 Mar 1988 (144-1988) was reported as a hybrid by the observer. After two circulations, the Committee unanimously agreed. American Oystercatchers in western Mexico and Baja California (*H. p. frazari*) are darker on the rump (particularly in the center), have a reduced wingstripe, and generally show black smudging below the dark breast. Consequently, they do not resemble the more clean-cut nominate birds pictured in standard field guides and are sometimes misidentified as hybrids. True hybrids are more intermediate, however, generally showing little white on the rump and having black intermixed extensively with the white on the underparts and wing linings. Jehl (1985) discussed the identification and status of hybrid American × Black Oystercatchers (*H. bachmani*).

HUDSONIAN GODWIT *Limosa haemastica*. A flock of ten reported at Red Hill, south end of the Salton Sea, IMP, 3 May 1990 (30-1991) lacked adequate documentation. All previous California records have involved lone birds, although a flock of sixteen was photographed on 17 Aug 1980 at Bayocean Spit, Oregon (Schmidt 1989).

RUFOUS-NECKED STINT *Calidris ruficollis*. A juvenile *Calidris* on SE Farallon I., SF, 15–16 Aug 1987 (245-1987) caused considerable debate among Committee members. A report of an alternate-plumaged bird at Mountain View, SCL, 13 Apr 1990 (66-1990) did not conclusively rule out the Sanderling (*C. alba*).

The Farallon bird was initially identified as a Rufous-necked Stint by its bright upperparts and the considerable primary projection beyond the longest tertial. After three circulations and a discussion at the 1992 annual meeting, the Committee left the identification of this bird unresolved, since most of its characters overlapped with those of a Semipalmated Sandpiper (*C. pusilla*). Furthermore, it was apparent that

RECORDS NOT ACCEPTED, identification questionable, Cont.

the Farallon bird was missing its longest tertial, thus exaggerating the apparent primary projection.

Alström and Olsson (1989) discussed the useful characters and warned of the pitfalls involved in field separation of juvenile Rufous-necked Stints and Semipalmated Sandpipers. They stressed the contrast between the center and sides of the crown as the best plumage feature. Many other characters are equivocal, and determining exact bill shape or lack of vestigial webs is notoriously difficult under field conditions. Indeed, there is no documented record of a juvenile Rufous-necked Stint in North America south of Alaska, and the number of Alaska occurrences was reduced when two juvenile "Rufous-necked Stint" specimens were reidentified as Little Stints (Gibson and Kessel 1992).

LITTLE STINT *Calidris minuta*. The report of a juvenile at Pescadero Marsh, SM, 26 Aug 1989 (42-1990) lacked details sufficient to eliminate other small *Calidris*. Of particular concern was the described size, since the bird was said to be "much smaller than Western Sandpiper and smaller than Least Sandpiper." The latter species is in fact the world's smallest *Calidris*.

CURLEW SANDPIPER *Calidris ferruginea*. A flock of 24 at Sacramento NWR, GLE, 16 Oct 1989 (129-1989) was not documented well enough for such an unprecedented report.

LITTLE GULL *Larus minutus*. The Committee expressed concern that the description of a reported first-winter bird at Malibu Lagoon, LA, 31 Oct 1988 (227-1988) did not rule out a Bonaparte's Gull (*L. philadelphia*) known to be present that still retained some juvenal plumage.

COMMON BLACK-HEADED GULL *Larus ridibundus*. A first-winter bird reported at Pt. Loma, SD, 23 Jan 1990 (61-1990) was published in *Am. Birds* 44:329. After two circulations, a majority of the Committee felt that the description was not sufficiently detailed to establish the southernmost record for western North America, as the bill was described as grayish yellow and the bird was not seen in flight. The bill color of first-winter Common Black-headed Gulls varies to some extent but typically between dull flesh and bright reddish pink (Grant 1986, Matt T. Heindel pers. comm.).

LESSER BLACK-BACKED GULL *Larus fuscus*. An incomplete description and concern about the exact age of the bird led the Committee to be cautious with a "second-spring" individual reported at Red Hill, south end of the Salton Sea, IMP, 9 May 1987 (178-1987; *Am. Birds* 41:488). Consequently, the record went four full rounds, after which voting was evenly split. Concerns over the age of a "first-summer" bird reported at Upper Newport Bay, ORA, 17 Sep 1989 (148-1989) and a lack of alleged corroborating photographs led to a near-unanimous decision that this record was not acceptable. All six of the accepted records for California fall between mid-September and late February, with four of these records for the Salton Sea, and all have been of basic-plumaged adults.

THICK-BILLED MURRE *Uria lomvia*. The details of one reported with Common Murres (*U. aalge*) at Cronkite Beach, MRN, 23 Aug 1989 (127-1989) did not eliminate a juvenile Common Murre.

PARAKEET AUKLET *Cyclorrhynchus psittacula*. Information about a beached corpse at Samoa, HUM, 31 Jul 1943 (115-1992) was published by Harris (1991). The CBRC was nearly unanimous in its rejection of this report, since no documentation to support the claim exists and the whereabouts of the specimen, if extant, is unknown.

RECORDS NOT ACCEPTED, identification questionable, Cont.

RUDDY GROUND-DOVE *Columbina talpacoti*. One was reported at Baker, SBE, 1 Oct 1989 (149-1989). This bird was seen at a distance and was said to be a calling male. Given the date, a majority of the Committee (eight members) felt that it was quite unlikely that a Ruddy Ground-Dove would be calling, and, given the distant views, felt that other species of *Columbina* could not be eliminated.

SNOWY OWL *Nyctea scandiaca*. Reports of one "in the hills approximately 4 mi. southeast of Arcata," HUM, 18 Feb 1967, one on Table Bluff, south Humboldt Bay, HUM, 24 Apr 1967, one "one-half mile north of Wilson Valley," MOD, 14 Apr 1967, and three "on state-line road at Klamath National Wildlife Refuge," SIS, 17 Apr 1967 were published by Harris and Yocum (1968) and combined for circulation through the Committee as record number 230A-1988. Although 1967 was an invasion year (four accepted records for Humboldt Co. 31 Jan–26 Mar plus one found dying in the Yolo Bypass, YOL, 4 Jan; Bevier 1990, Roberson 1993), there are no descriptions of any of these birds beyond "white" or "barred." Moreover, all fall outside the pattern established by the vast majority of records of this species in California: birds on open land at sea level on the immediate coast from late October through March. The only exceptions among accepted records are of one at "Upper Mattole," HUM, 17 Nov 1916 (Roberson 1986), one in Gridley, BUT, 17 or 18 Nov 1916 (Roberson 1986), and the Yolo Co. bird mentioned previously.

BROAD-BILLED HUMMINGBIRD *Cynanthus latirostris*. A male reported in Santa Barbara, SBA, 20 Sep 1978 (223-1987) was published in *Am. Birds* 33:214 and by Webster et al. (1980). Although a majority voted to accept the record on each of four circulations, it had the required number of detractors on every round. The record consisted of a recounting by one Committee member of a brief verbal description of a bird seen well and repeatedly (on one day only).

GREEN KINGFISHER *Chloroceryle americana*. One reported near Mecca, RIV, 26 Jan 1991 (28-1991) would have been California's first. The identification was insufficiently documented to meet the Committee's requirements for a first state record; it received but one accept vote on its only circulation. Five Committee members felt that this species is likely to be found in California, four did not volunteer their thoughts, and one thought the species unlikely to occur, despite reports for the lower Colorado River (Rosenberg et al. 1991).

YELLOW-BELLIED FLYCATCHER *Empidonax flaviventris*. An *Empidonax* at Pt. Saint George, DN, 13 Sep 1988 (78-1989) was published tentatively as this species in *Am. Birds* 43:164 and by Harris (1991). Most members expressed their opinion that the identification was probably correct. The single observer is excellent and experienced. Much of the description suggested a Yellow-bellied Flycatcher: rich green-olive upperparts, yellowish-white wingbars, short bill with entirely yellow-gold mandible, round yellow eye ring, bright yellow underparts with olive vest and sides, and short tail. Not mentioned were tertial pattern, blackish wings, and head shape, and the call was not heard. Through two circulations, a majority of members was unwilling to accept a single-observer sighting with anything less than exhaustive details. *Empidonax* identification remains one of the most difficult tasks facing North American birders, despite the efforts of Zimmer (1985), Whitney and Kaufman (1985a,b, 1986a,b, 1987), Kaufman (1990), and others to clarify the situation. See also comments under Records Accepted.

GREAT CRESTED FLYCATCHER *Myiarchus crinitus*. One reported at Creighton Ranch Preserve, TUL, 7–*11* Oct 1988 was published in *Am. Birds* 43:164. This inland record received some support but was judged very cautiously; several members suggested the bird may have been a Brown-crested Flycatcher (*M. tyrannulus*).

RECORDS NOT ACCEPTED, identification questionable, Cont.

SULPHUR-BELLIED FLYCATCHER *Myiodynastes luteiventris*. One was reported in San Diego, SD, on an unknown date in October 1989 (14-1990).

SCISSOR-TAILED FLYCATCHER *Tyrannus forficatus*. Single birds were reported in the Arcata Bottoms, HUM, 10 Oct 1976 (117-1992; Harris 1991), in Torrance, LA, 7 Jun 1989 (35-1991), and at Mono Lake, MNO, 28 Jun 1989 (71-1990; *Am. Birds* 43:1364–1365).

BLUE JAY *Cyanocitta cristata*. One reported at Trinity Village, near Hawkins Bar, TRI, 9 or 10 Feb 1990 (69-1990) was published by Harris (1991) and tentatively in *Am. Birds* 44:325

NORTHERN WHEATEAR *Oenanthe oenanthe*. One reported on Bear Ridge, west of Rio Dell, HUM, 23 Sep 1975 (118-1992) was published tentatively by Harris (1991).

VEERY *Catharus fuscescens*. Single birds were reported on SE Farallon I., SF, 28 May 1981 (101-1987) and San Nicolas I., VEN, 15 Sep 1988 (3-1989). The former was published in *Am. Birds* 35:860 and by Pyle and Henderson (1991). Of 15 Veery reports reviewed by the Committee, only seven have been accepted. In noting this, one member wrote, "clearly this species is misidentified often." Actually, a majority of members acknowledged that both of these birds may have been correctly identified. What *is* clear is that reports of this species continue to be judged cautiously. Pyle and McCaskie (1992) mentioned most of the characters used in the Committee's analysis of reports of this species.

GRAY-CHEEKED THRUSH *Catharus minimus*. A report of one on SE Farallon I., SF, 3 Oct 1970 (20-1989) has long been considered valid (McCaskie et al. 1979, DeSante and Ainley 1980, Roberson 1980, Pyle and Henderson 1991). The bird was one of two Gray-cheeked Thrushes reported that day (the other was collected and represents California's first record; DeSante and Ainley 1980, Dunn 1988), but no description was written until over 18 years later. A majority of Committee members was unwilling to validate such a record, considering it undocumented and thus "not accepted" (see Roberson 1993).

FIELDFARE *Turdus pilaris*. A report of one reported at Pacific Grove, MTY, 28 Dec 1989 (24-1990) would have been California's first record, but the details were such that it failed to receive any support.

CURVE-BILLED THRASHER *Toxostoma curvirostre*. Single birds were reported at Imperial Dam, IMP, 29 Dec 1987–1 Jan 1988 (38-1988) and Hole-in-the-Wall Campground, East Mojave Scenic Area, SBE, 4 Apr 1990 (95-1990).

The former record, published in *Am. Birds* 42:323, circulated three times with substantial support, was discussed at an annual meeting, and finally was rejected soundly on a fourth and final circulation. The Committee would be interested in reviewing any additional documentation should it currently exist.

The latter record was a difficult one for many reviewers as well, but was rejected on a single circulation. "We have a good observer who is knowledgeable about thrasher status and distribution, and a reasonable description," wrote one Committee member. Nevertheless, as a whole, the Committee was sufficiently concerned about the date and location (perfect for the similar Bendire's Thrasher, although none were noted), the long interval between the sighting and the write-up, and certain weaknesses in the description (lacking mention of bill *color*, and relying on several questionable field marks: eye color, buffy underparts, and white tail spots), so treated the record cautiously. Clearly the Committee considers the identification of Curve-billed and Bendire's thrashers difficult and was unwilling to break the pattern of

RECORDS NOT ACCEPTED, identification questionable, Cont.

primarily winter records from more heavily vegetated areas in Imperial Co. to embrace this report. Zimmer (1985), Kaufman (1990), and Kaufman and Bowers (1990) most recently discussed the identification of these two species.

GRAY WAGTAIL *Motacilla cinerea*. One at Dog Lake near Tuolumne Meadows, Yosemite NP, TUO, 23 May 1990 (107-1990) was published tentatively in *Am. Birds* 44:493.

*RED-THROATED PIPIT *Anthus cervinus*. Two reported at Lanphere Dunes, west of Arcata, HUM, 27 Nov 1988 (269-1988; Harris 1991) were not considered adequately documented to establish the latest record for California by nearly two weeks. There is, however, an acceptable record for Delta, British Columbia, 23–24 Dec 1990 (Siddle 1991).

PHILADELPHIA VIREO *Vireo philadelphicus*. Single birds were reported at Pt. Reyes, MRN, 17 Oct 1988 (9-1989), San Leandro Reservoir, San Leandro, ALA, 8 Jun 1975 (97-1989), Pt. Loma, SD, 14 Oct 1989 (15-1990), and Golden Gate Park, San Francisco, SF, 19 Oct 1980 (75-1990). Only the Pt. Loma record was previously published (*Am. Birds* 44:164). The rejection rate of Philadelphia Vireo records remains high (nearly one in four), countering efforts by some to remove the species from the Review List. All too often, documentation submitted for this species is incomplete. Claims of the Philadelphia Vireo should include details of the extent and distribution of yellow on the underparts, pattern of the lores, and upperpart coloration. See Terrill and Terrill (1981), Zimmer (1985), and Kaufman (1990) for more about field identification criteria for this species.

YELLOW-GREEN VIREO *Vireo flavoviridis*. One was reported at Batiquitos Lagoon, SD, 29 Oct 1989 (201-1989).

YELLOW-THROATED WARBLER *Dendroica dominica*. One was reported at Legg Lake, LA, 3 Feb 1985 (88-1986).

PINE WARBLER *Dendroica pinus*. A bird banded and photographed at Modoc NWR, MOD, 19 Sep 1989 (36-1990) was unanimously identified by the Committee as a Blackpoll Warbler (*D. striata*), a significant, previosuly unpublished record nevertheless, one of the few for the interior of northern California. Bay-breasted and Blackpoll warblers are still routinely misidentified as Pine Warblers by the unwary. September reports are especially suspect, as the Pine Warbler is a late migrant with few California records before mid-October. The writings of Whitney (1983), Kaufman (1990), and Patten and McCaskie (1992) may help observers avoid identification pitfalls.

CONNECTICUT WARBLER *Oporornis agilis*. One was reported at Mojave, KER, 20 May 1990 (70-1990). With no accepted California records for May, the Committee was unwilling to support a briefly seen bird at this well-worked locality.

SCARLET TANAGER *Piranga olivacea*. One was reported on Pt. Loma, SD, 6 Nov 1989 (20-1990).

PAINTED BUNTING *Passerina ciris*. One reported at Galileo Hill Park, KER, 7 Oct 1989 (21-1990) was seen too briefly for even the reporter, a CBRC member, to vote "accept."

LE CONTE'S SPARROW *Ammodramus leconteii*. One was reported at Furnace Creek Ranch, INY, 25 Nov 1989 (212-1989).

COMMON GRACKLE *Quiscalus quiscula*. One reported feeding a fledgling west of Fresno, FRE, 12 Jun 1989 (74-1990) was discussed by Bailey et al. (1989a), who suggested the bird may have been a Great-tailed Grackle (*Quiscalus mexicanus*).

RECORDS NOT ACCEPTED, identification questionable, Cont.

ORIENTAL GREENFINCH *Carduelis sinica*. A bird briefly seen and heard in Arcata, HUM, 17 Apr 1988 (119-1988) was published in *Am. Birds* 42:480 and tentatively by Harris (1991). Although the observer had experience with this species from the previous winter (see next account), the Committee was unwilling to accept such a brief observation of an extreme rarity.

RECORDS NOT ACCEPTED, Natural Occurrence Questionable

ORIENTAL GREENFINCH *Carduelis sinica*. A female or immature male generally associating with House Finches (*Carpodacus mexicanus*) in south Arcata, HUM, 4 Dec 1986–3 Apr 1987 (Figure 8; SFB, BB, JLD, KH†, JMH†, JML, CAM, GMcC, JM, DR; 450-1986) was seen by probably hundreds of observers from across the continent. The bird's occurrence was discussed previously by Morlan et al. (1987).

In four circulations of this record through the Committee there were few strong convictions expressed, though the file is now approximately 150 pages long. Five or six members supported natural occurrence on each round, but nine of the 16 members to vote on the record never took that position. The species was considered for the incipient Supplemental List of the birds of California (see the introduction to this paper) at the January 1993 CBRC meeting, where it easily received the simple majority vote needed for acceptance. The Supplemental List owes its existence to controversial records such as this one.

There was general agreement among Committee members that the Arcata bird was from the northeast portion of the species' range where it is most highly migratory, a requisite for consideration as a genuine vagrant. Nevertheless, it was noted that this species has established no pattern of long-distance vagrancy in the Old World; American records are all from the outer Aleutian Islands, not far from the breeding range. Stephen F. Bailey and Louis R. Bevier examined specimens at the American Museum of Natural History, finding that the combination of large size, large bill, face pattern (dusky lores, broad dusky malar region with lighter coloration on the chin and lower cheek highlighting the dark malars, and indistinct broad pale supercilia running posterior from the top middle of the eyes), and overall brownish tone of the Arcata bird suggest the race *kawarahiba*. This is the northernmost form, breeding on Kamchatka, the Kuriles, Sakhalin, and Hokkaido and wintering from Hokkaido south through Japan to Taiwan. Mainland races are smaller and essentially nonmigratory.

Oriental Greenfinches are rare but not unknown in captivity in the United States. In Taiwan, wintering birds are apparently captured for use as cage birds (Yen 1984). Most Committee members felt the odds of the Arcata greenfinch being an escapee from captivity were small, but few were willing to rule out the possibility and fully support the bird's natural occurrence.

ADDENDA AND CORRIGENDA TO THE THIRTEENTH COMMITTEE REPORT (Pyle and McCaskie 1992)

Under Records Accepted, p. 121: the Snow Bunting in Humboldt Co. was near Rio Dell, not Del Rio. Under Records Not Accepted, p. 122: the Trumpeter Swan (208-1988) died in captivity. Photographs of the unprepared skin are now on file with the record. The skeleton, but not the skin, was preserved as SBMNH 4059. The bird was a Tundra Swan.

CONTRIBUTORS

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Committee members who reviewed some or all of the records contained in this report are Stephen F. Bailey, Louis R. Bevier, Jon L. Dunn, Erickson, Matt T. Heindel, Kimball L. Garrett, Jeri M. Langham, Paul E. Lehman, Michael J.

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FURTHER DATA ON SCREECH-OWL DISTRIBUTION AND HABITAT USE IN WYOMING

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Fitton's (1993) report on the distribution of the Western (*Otus kennicottii*) and Eastern (*O. asio*) Screech-Owls in Wyoming was prompted by the lack of information on them and their recent recognition as distinct species. For nearly the same reasons, we undertook a similar project without being aware of Fitton's study. Here we report the results of our work that confirm, amplify, and extend his.

STUDY AREA AND METHODS

In mid-March 1992, we began calling Screech-Owls with taped songs played on a Panasonic Model RQ-341 cassette tape recorder at full volume but without an amplifier or external speaker. Both the Eastern and Western songs were arranged from the National Geographic Society recordings (Guide to Bird Sounds, 1983). The Eastern arrangement was one secondary song (single trill) and three primary songs ("whinny") in close succession [see Marshall (1967) for terminology and sonagrams]. This arrangement was repeated five times in close succession to form one 2-minute sequence. The Western arrangement was one primary song ("bouncing ball"), three secondaries (double trill), and one primary in close succession. This arrangement was also repeated five times in close succession to form one sequence of 2 minutes, 35 seconds. The first song played at a location was for the species that we expected in that area, followed by the song of the other species. For each species, we played the entire sequence twice (unless an owl responded before we finished), separated by about a 30-second pause. Rarely, we played a third sequence. We usually started playback at dusk and finished by 0200, moving from location to location. We terminated the survey on 18 July except at two marginal locations that we visited on 22 and 26 August 1992.

Survey locations, primarily aspen and riparian cottonwood stands, were selected mostly on the basis of accessibility and habitat suitability as reported in the literature and verbally by other observers. We attempted to cover the entire state somewhat uniformly (Figure 1). We surveyed 145 locations representing all of Wyoming's 23 counties. All locations were at least 1.7 km apart, usually much more. At 25 locations we called at more than one point (up to 10), depending on the extent of potential habitat and accessibility or until an owl responded. These points were separated by 0.6 to 1.6 km. At 19 of the locations where no owl responded on our first visit, we returned at a later date and called again. West of the continental divide we called in every month from March through August. East of the divide we called in every month of this same period except for June. From March through May we also called in habitats where the owls were not expected. We called at the exact locations of all verifiable spring and summer reports of Western Screech-Owls, one several years after the initial report, the others 2–3 months after the owls were first heard.

At locations where one or more owls responded, we returned in daylight and recorded up to six dominant tree and shrub species and the density of the shrub understory within a 100-m radius. At points where no owl responded, we recorded only the dominant trees.

R. D. Dorn attempted to evaluate all Screech-Owl reports from Wyoming since1983 by searching for any documentation accompanying the reports. He also examined Screech-Owl specimens at the University of Wyoming, Denver Museum of Natural History, National Ecology Research Center (Fort Collins, Colorado), Yellowstone National Park, and Grand Teton National Park.

RESULTS

Eastern Screech-Owls responded at 21 locations in 13 counties (Figure 1). We had no response from a Western Screech-Owl at any location. Nineteen responses were on the first visit to a location and two responses were on a second visit. The locations where Eastern Screech-Owls re-

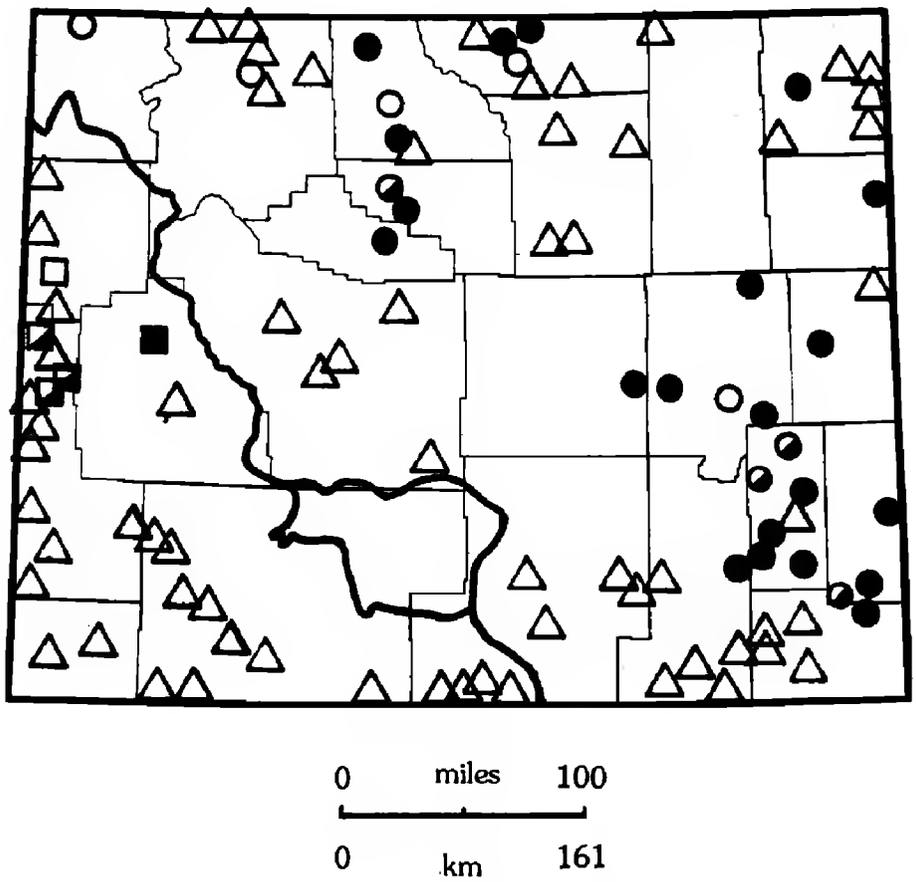

Figure 1. Verified Screech-Owl reports in Wyoming and sites surveyed during this study. One symbol may represent more than one location. Eastern Screech-Owl: solid circle, response to taped songs (this study); open circle, specimen; half-solid circle, well-documented report. Western Screech-Owl: solid square, response to imitated song; open square, specimen; half-solid square, well-documented report. Triangle, no response to taped songs of either species (this study). The continental divide is represented by the line from the upper left to the lower center.

sponded were all east of the continental divide and all below 1890 m (6200 ft) elevation. At 15 locations a single individual responded, at 5 locations two individuals responded, and at 1 location three individuals responded (3 April). At 2 locations the birds responded with just the whinny, at 8 locations they responded with just the trill, and at 11 locations they responded with both the whinny and trill. At a number of locations where we expected Eastern Screech-Owls, we had no response possibly because of poor calling conditions, i. e., strong wind, traffic noise, or stream noise. On our first survey night, 14 March, owls responded at four of six locations. The last response was on 7 July. Our earliest response was at dusk on 14 March (1900 MST). The latest was at 0010 MST, 7 July. Most of the responding owls were observed with artificial light at a distance of 2 to about 50 m. A few would not come closer than about 200 m. Our 21 Screech-Owl responses were all at locations different from the 6 locations where Fitton (1993) observed the birds as well as from the locations from which he reported photos or specimens.

Early in the survey, it became clear that large (diameter at breast height > 50 cm) Plains Cottonwoods (*Populus deltoides*) were an important component of Eastern Screech-Owl habitat. That tree was present at all locations where an owl responded, with one exception, but it was not always the dominant tree species (Table 1). Peachleaf Willow (*Salix amygdaloides*) and Boxelder (*Acer negundo*) were the next most common trees. All three of these species tend to grow together along streams on the plains. This is the same habitat described by Rockwell (1907) for

Table 1 Dominant Tree and Shrub Vegetation at the 21 Locations Where Eastern Screech-Owls Responded to Taped Songs

Species	Number of locations	
	One of six most abundant woody species	Single most abundant woody species
Populus deltoides, Plains Cottonwood	20	11
Salix amygdaloides, Peachleaf Willow	15	1
Acer negundo, Boxelder	9	4
Populus angustifolia, Narrowleaf Cottonwood	7	2
Populus acuminata, Lanceleaf Cottonwood	6	2
Fraxinus pennsylvanica, Green Ash	4	1
Populus balsamifera, Balsam Poplar	1	0
Quercus macrocarpa, Bur Oak	1	0
Elaeagnus angustifolia, Russian Olive	10	0
Prunus virginiana, Chokecherry	2	0
Juniperus scopulorum, Rocky Mountain Juniper	2	0
Prunus americana, Wild Plum	1	0

the Eastern Screech-Owl in Colorado. In Saskatchewan, this owl is found in riparian Boxelder (Adam 1987). Plains Cottonwood generally drops out at elevations above 1830 m (6000 ft) in southern Wyoming and above 1525 m (5000 ft) in the north. The other two species generally continue for another 150 m (500 ft) in elevation. At higher elevations, these trees are replaced by Narrowleaf Cottonwood (*Populus angustifolia*) and Balsam Poplar (*Populus balsamifera*). The confluence of Johnson and Sybille creeks in Albany County, the only location where an owl responded that lacked Plains Cottonwood, was at the highest elevation where we found the species, about 1860 m (6100 ft). Both Peachleaf Willow and boxelder were present at this location. Fitton's (1993) report from 4.8 km farther up Sybille Creek extends the altitudinal range to 1920 m (6300 ft). Rockwell (1907) indicated that in Colorado the Eastern Screech-Owl rarely ascends above 1830 m (6000 ft). Unverified reports of Screech-Owls in Wyoming east of the continental divide, all likely of Easterns, are from as high as 2350 m (7700 ft).

The shrub understory was open (< 50% canopy cover) at seven locations where owls responded, moderately dense (50–75 % canopy cover) at nine locations, and very dense (> 75% canopy cover) at five locations. We had no response from owls in stands of Plains Cottonwood where the trees were widely scattered (ca. 62 trees/ha or 25 trees/acre) with little or no shrub understory. The number of points in each habitat where we surveyed for Screech-Owls is presented in Table 2.

Since we had no response from a Western Screech-Owl, we questioned the adequacy of our tape. To test its effectiveness, John Barnes of

Table 2 Habitats Surveyed for Screech-Owls in Wyoming

Habitat	Number of points with	
	Response	No response
East of continental divide		
Plains Cottonwood–Peachleaf Willow–Boxelder	18	52
Narrowleaf Cottonwood	1	31
Lanceleaf Cottonwood–Plains Cottonwood	1	0
Green Ash–Bur Oak	1	0
Bur Oak–Paper Birch–Ponderosa Pine	0	5
Aspen	0	4
Ponderosa Pine–Douglas Fir	0	3
West of continental divide		
Aspen	0	42
Narrowleaf Cottonwood	0	34
Utah Juniper	0	7
Douglas Fir–Lodgepole Pine	0	1
Bigtooth Maple	0	1
Balsam Poplar	0	1
Gambel's Oak	0	1

Smithfield, Utah, took a copy of our tape to Smithfield Canyon on 17 October 1992 and had three responses from Western Screech-Owls in nine stops along 6 km (3.7 mi) of Narrowleaf Cottonwood habitat below 1645 m (5400 ft).

The main physical characteristics distinguishing the Eastern and Western Screech-Owls, the color of the base of the bill and relative thickness of barring on the feathers (Kaufman and Bowers 1989, Kaufman 1990), are not useful in Wyoming. Kaufman (1990) stressed that there were local exceptions to many of the points he presented. Marshall (1967) indicated that bill color is the same in *O. asio* and *O. kennicottii macfarlanei*, the race of the Western to be expected in northwestern Wyoming. The best distinction seems to be that *O. a. maxwelliae* has rather sparse barring on the underparts with extensive white showing through whereas *O. k. macfarlanei* and *aikeni* have relatively dense barring on the underparts with the white not especially prominent. This is usually quite easy to see in direct comparison of specimens. With a little practice a single specimen can be identified, but these characteristics are extremely difficult to evaluate in the field under poor or artificial light.

Fitton (1993) found Western Screech-Owls at two locations about 2 km apart at 2380 m (7800 ft) in Sublette County, Wyoming. He found no other documentation for the species in the state. Kathi Clark and Dave Crowe described for us the "bouncing ball" song of three Western Screech-Owls that they heard in the Greys River drainage basin of Lincoln County below 2195 m (7200 ft) from 15 March to 1 April 1992.

Figure 2. Mounted specimen of Western Screech-Owl collected on 30 December 1989 about 2.5 km west of Jackson, Wyoming.

We located two Screech-Owl specimens from Wyoming not reported by Fitton (1993). A specimen in Yellowstone National Park picked up dead at the Albright Visitor Center, Mammoth, at 1890 m (6200 ft) on 15 July 1988 we identified as an Eastern Screech-Owl (*O. a. maxwelliae*) by its white underparts with sparse barring. A mounted specimen of a Western Screech-Owl that we examined at Grand Teton National Park was picked up dead on Spring Creek 2.5 km west of Jackson at 1890 m (6200 ft) on 30 December 1989, and is the only known Western Screech-Owl collected in Wyoming (Figure 2). It has the dark underparts, dense barring, light-colored bill, and long wing (180 mm) characteristic of *O. k. macfarlanei*.

DISCUSSION

The distribution of the Eastern Screech-Owl in Wyoming corresponds with several interrelated factors. There is a close correspondence with the distribution of Plains Cottonwood stands along streams on the eastern plains and in the Big Horn Basin (Figures 3a, b). Average annual temperature of over 7° C (44° F) also corresponds closely (Figures 3a, c). There is slightly less correspondence with duration of snow cover (Figures 3a, d).

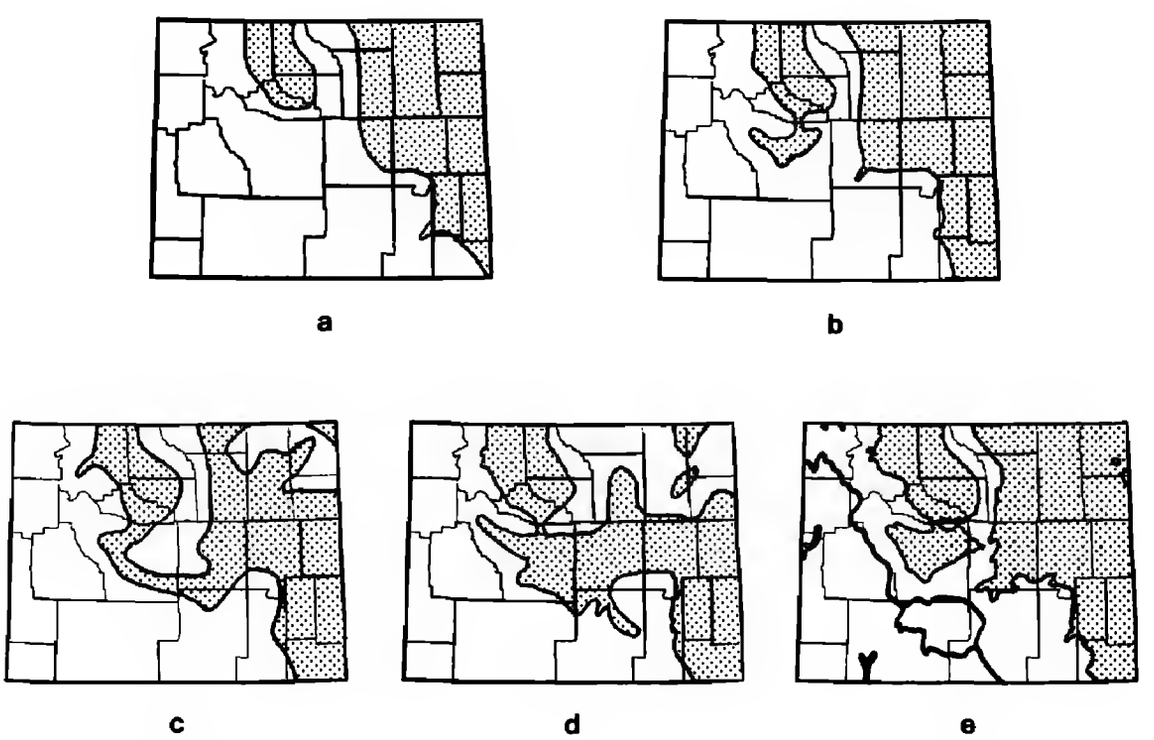

Figure 3. Wyoming. a, Generalized Eastern Screech-Owl distribution (shaded area). b, Generalized Plains Cottonwood distribution based on specimens in the Rocky Mountain Herbarium, University of Wyoming, and personal observations (shaded area). c, Average annual temperature (Martner 1986): shaded area, 7° C (44° F) and above; unshaded area, below 7° C. d, Average number of days per year with 2.5 cm (1 inch) snow cover or more: shaded area, <70 days; unshaded area, >70 days. Extrapolated from data in Martner (1986) for the period 1951–1980. e, Elevation: shaded area, <1830 m (6000 ft), unshaded area, >1830 m. The continental divide is represented by the line from the upper left to the lower center.

Riparian tree distribution is most important, since without the trees there are no owls regardless of other favorable conditions. Temperature is indirectly related by providing suitable growing conditions for the trees and preventing excessive snow cover, which might interfere with successful foraging. The influence of elevation is even more indirect through its effect on temperature.

There were two areas where we expected Eastern Screech-Owls but did not find them. The Powder River in Johnson County and the Wind and Popo Agie rivers in Fremont County appeared to have suitable habitat in places, but no owls responded at the eight points (six and seven locations, respectively) where we called in each area. It is possible that the lack of riparian trees in the 20 km (12 mi) of the Wind River Canyon is a barrier to Screech-Owl dispersal into the Wind River Basin.

Wyoming reports of Western Screech-Owls are from habitats not typical for the species in adjacent states. Marshall (1967), Hayward (1983), and Holt and Hillis (1987) reported them in riparian forests below about 1830 m (6000 ft) elevation. The habitats they described are largely absent from Wyoming, and west of the continental divide in Wyoming, only two small areas are below 1830 m (Figure 3e). Habitat for Western Screech-Owls in Wyoming appears marginal at best and probably explains their scarcity. Hayward (1983) thought that the Western Screech-Owl's distribution on his Idaho study site was strongly influenced by habitat but that prolonged snow cover and cold might determine its upper elevational limit. Holt and Hillis (1987) reported one nesting in aspen in western Montana and indicated that Western Screech-Owls are occasionally observed in mixed coniferous forests away from riparian areas. Fitton (1993) found the species in two successive years at New Fork Lakes, but the Lincoln County reports may represent young birds looking for an unoccupied territory or just wandering. The sites in Sublette and Lincoln counties are wooded with Quaking Aspen (*Populus tremuloides*). In Jackson Hole, besides the single specimen, there are inadequately documented but nearly year-round reports, suggesting a resident population in large riparian cottonwoods (*Populus balsamifera*, *P. angustifolia*). Inadequately documented reports from Green River and Baggs in southwestern Wyoming may represent *O. k. aikeni* and should be followed up, although neither we nor Fitton (1993) had any responses there.

SUMMARY

There is no verifiable evidence that the Eastern and Western Screech-Owls overlap in Wyoming. Eastern Screech-Owls are fairly widespread east of the continental divide in cottonwood-dominated riparian woodland up to 1920 m (6300 ft) elevation. Western Screech-Owls are rare, localized, and possibly irregular west of the continental divide. Only one specimen of the Western, from near Jackson, has been preserved. Occasional wandering of either species into the range of the other would not be expected often since the mountains and treeless high-desert basins along the continental divide likely form an effective barrier to Screech-Owl dispersal.

ACKNOWLEDGMENTS

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SEASONAL STATUS OF THE AMERICAN PIPIT IN IDAHO

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In Idaho, the American Pipit (*Anthus rubescens*) has been considered primarily a migrant, either locally common but erratic (Larrison et al. 1967) or uncommon in spring and common in fall (Burleigh 1972). Several other writers (Merriam 1891, Merrill 1898, Newhouse 1960, Levy 1962) considered it an abundant fall migrant but gave no indication of actual numbers. The one (Larrison et al. 1967) or two (Burleigh 1972) winter records were from Lewiston. Larrison et al. (1967) suspected that pipits might breed on some of the state's high mountains, while Burleigh (1972) knew of only Merriam's (1891) statement that they breed in the Salmon River Mountains and a report by L. B. McQueen of breeding in the upper Pahsimeroi drainage near Borah Peak. This scantiness of breeding evidence may be why the most recent A.O.U. checklist (1983) states that the American Pipit breeds locally on mountaintops in several Rocky Mountain states but does not specifically list Idaho.

In this paper I consolidate and enhance what is known about American Pipit distribution in Idaho with reference to adjacent areas. I present evidence of additional breeding, concentrations of thousands of fall migrants, and the species' regular but erratic wintering in much of southern Idaho. I analyze Christmas Bird Count data for patterns in winter distribution related to differences in weather, elevation, geography, and annual variability.

METHODS

I gathered recent American Pipit records from a literature review and my own field notes for the last 15 years. All Christmas Bird Counts (CBCs) for Idaho since 1978 were included, as well as some from adjacent Montana and Washington. Long-term counts from southern Idaho were examined statistically in a manner similar to that of Laurance and Yensen (1985) and Dunning and Brown (1982). Weather data were extracted from U.S. Environmental Data Service monthly reports from each weather station in or close to each CBC. Using number of birds per party-hour, I compared differences between areas and between years by analysis of variance (ANOVA), and examined influences of weather and elevation by multiple regression (Zar 1974). This was done on a MacIntosh SE computer with a Statview statistical package. I also surveyed the extensive mudflats at the mouth of the New York Canal, Lake Lowell, Canyon Co., for American Pipits 18 times from August through November 1990.

RESULTS

Breeding

In the Sawtooth Mountains I observed an adult American Pipit feeding a young bird on the Custer Co. side of the summit along the trail between

Toxaway and Alice lakes, elevation 2775 m, on 26 July 1989 and an adult behaving territorially near Alpine Lake, Custer Co., elevation 2625 m, on 3 August 1993 (Figure 1). I found a pair of pipits giving alarm calls and carrying food in their beaks in the Henry's Lake Mountains, elevation 2850 m, Fremont Co., on 29 July 1993. C. Trost (pers. comm.) found several nesting pairs with young at the head of the east fork of the Pahsimeroi River on 25 July 1976 [American Birds (AB) 30:981] and a nest on Leatherman Peak, Big Lost Range, Custer Co., elevation about 3200 m. Roberts (1992) found American Pipits in the nesting season between 2400 and 3050 m in the Lemhi and Beaverhead ranges and at Long Tom Lookout, Challis Creek Lakes, and Taylor Mountain between the Middle Fork and main Salmon Rivers. These locations might be considered part of the Salmon Mountains of Merriam (1891).

Fall Migration

At Lake Lowell (Figure 1) in 1990, no American Pipits occurred in August, and I found only one to four on five dates from 6 to 18 September. On 27 September there were 600, and numbers peaked at 1750 on 9 October. There were still hundreds by 16 and 18 October, and from late October to mid-November dozens remained. A few lingered into December. At this same location J. Gatchet estimated pipits gathered in the thousands in the last week of September 1991 (AB 46:125).

Large number of pipits have been reported from other locations in Idaho and adjacent areas in late September or October. Thousands were at Rupert in fall 1971 (AB 26:98). I found flocks of over 100 on farmland in the Dry Lake region of Canyon Co. in the last week of October 1976, and 140 at American Falls Reservoir, Power Co., on 22 September 1990. In eastern Washington 500 were at Banks Lank on 17 September 1983 (AB 38:226), 200 were at Spokane on 8 October 1972 (AB 27:90), 2000 were at O'Sullivan Dam on 9 Oct 1971 (AB 26:91), and at least 1000 were near Reardan on 21 September 1973 (AB 28:81). Hundreds were found in alpine meadows on Steens Mountain, Oregon, on 24 September 1983 (AB 38:226), 2000 were estimated at Brigham City, Utah, on 22 October 1972 (AB 27:298), and thousands were in Cache Valley, Utah, on 5 October 1942 (Bent 1950).

Winter

In winter, the American Pipit is unrecorded from northern Idaho, except at Lewiston, the state's lowest elevation, where Burleigh (1972) lived from 1948 to 1958 and recorded pipits only twice: a single bird on 21 December 1951 and a flock of 60 on 8 and 13 January 1954. The 33 CBCs conducted at Moscow, Indian Mountain, Sandpoint, and Coeur d'Alene from 1978 to 1991 recorded no pipits. There were also no pipits on the northwestern Montana and eastern Washington CBCs at Troy, Libby, Glacier National Park, Big Fork, or Spokane during this time. In central Idaho, the two CBC areas of Sun Valley and Salmon recorded pipits just once in 14 years, but a total of 86 at Salmon in December 1986. The Missoula, Montana, CBC has had just one pipit once, and a record for 17

December 1989 at Ninepipe NWR (AB 44:297) was apparently only the second for western Montana in winter.

Pipits have been found erratically in winter on CBCs in southern Idaho (Table 1). Perhaps because of high variability, there were no significant differences in numbers of pipits between any of the nine southern Idaho CBC areas (ANOVA, $P > 0.10$ in all comparisons; Bruneau was excluded owing to its short duration). Pipits have been recorded in about 45% of the years on the seven of the ten CBCs where they have been found more than once, but no count found them more than 58% of the time. The highest

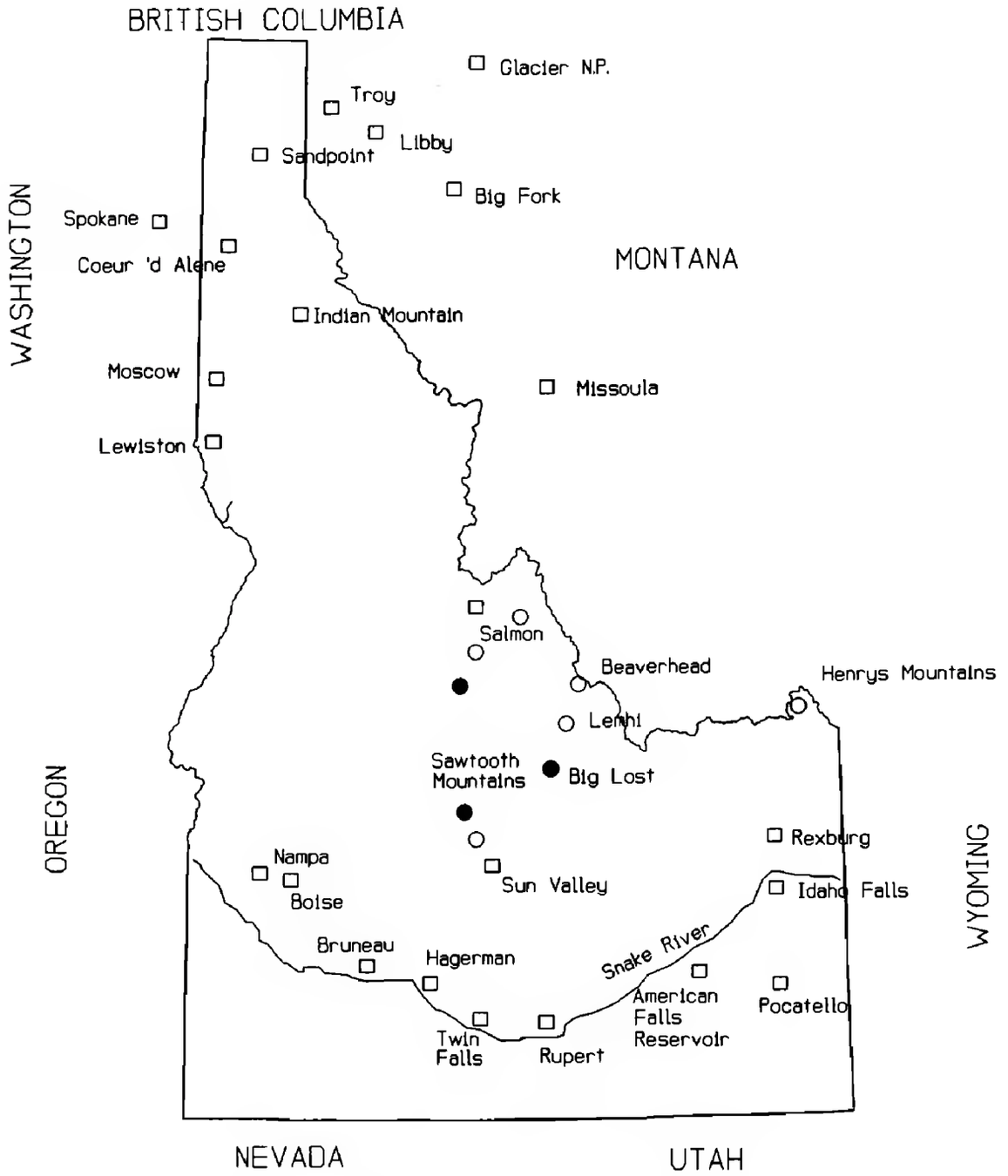

Figure 1. Locations mentioned in the text. Solid circles, known breeding locations; open circles, probable breeding locations; solid squares, locations of Christmas Bird Counts.

Table 1 Numbers of American Pipits on Christmas Bird Counts in Southern Idaho from 1978 to 1991

Area	Elevation (feet)	Years of count	High count	Mean ± SE[a] (Range) pipits/party-hour
Nampa	2210	14 (7)[b]	242	0.327 ± 0.223 (0–3.15)
Bruneau	2455	7 (4)	326	1.601 ± 1.306 (0–9.30)
Boise	2700	14 (5)	30	0.039 ± 0.022 (0–0.95)
Hagerman	2900	13 (6)	34	0.135 ± 0.072 (0–0.95)
Twin Falls	3170	12 (4)	423	1.174 ± 1.096 (0–13.22)
Rupert	4150	14 (6)	70	0.382 ± 0.277 (0–3.91)
Am. Falls	4180	14 (8)	23	0.059 ± 0.023 (0–0.29)
Pocatello	4200	14 (1)	1	0.001 ± 0.001 (0–0.02)
Idaho Falls	4610	14 (0)	0	0
Rexburg	4800	14 (1)	200	0.510 ± 0.510 (0–7.14)

[a]SE,standard error.
[b]Number of years with pipits on count.

number on any count was 423 at Twin Falls in 1986, and Nampa, Bruneau, and Rexburg each had a single count with over 100 pipits.

Although the three southern Idaho CBCs at the highest elevations recorded pipits on only two of 42 counts, pipit numbers were not significantly correlated with elevation (Table 2). There was no significant association of the abundance of American Pipits on CBCs with the climatic factors of minimum snow, mean December temperature, or mean December precipitation (Table 2). The 200 pipits in 1979 constituting Rexburg's only record was one of the few years there without snow on the ground, and the Twin Falls peak of 423 also coincided with a CBC free of snow. However, there were 3 inches of snow in Nampa when 175 pipits were found, while Bruneau recorded 279 with one-half inch of snow and 44 with 3 inches of snow and temperatures of −22 to −32° C.

Table 2 Relation of Various Climatic Factors and Elevation with American Pipit Numbers on Combined Idaho Christmas Bird Counts, 1978–1991[a]

Factor	*F* test[a]	*P*[b]	R^{2c}
Minimum snow depth	0.547 (0.593)	0.46 (0.44)	0.01 (0.01)
Elevation	1.303 (0.414)	0.28 (0.52)	0.02 (0.01)
Mean December precipitation	0.008	0.928	<0.01
Mean December temperature	1.731	0.19	0.02

[a]*F*-test values of multiple regression for all counts, and in parentheses all counts except Idaho Falls, Rexburg, and Pocatello, excluded because of their higher elevation.
[b]Probability values of *F* tests.
[c]Amount of variation explained by these factors.

For all southern Idaho CBCs combined (Bruneau excluded because of its shorter duration), numbers of pipits were highest in 1979, 1981, and 1986. The number of pipits per party-hour was significantly higher in 1986 than in most other years (ANOVA, $P < 0.05$), but this was probably due to the single very large total at Twin Falls. In years with few birds, pipits were still found on at least two CBCs, except in 1983 when only four birds were at Rupert. In the three years with the highest counts three or four CBC areas still lacked pipits.

DISCUSSION

The two new definite breeding records and other midsummer observations further establish the American Pipit as a breeding species in Idaho. The alpine zone in the state has been inadequately surveyed, and it is likely there are more areas in the high country that support pipits, especially as breeding pipits are known from adjacent alpine zones in Yellowstone National Park and on the Beartooth Plateau, Wyoming (McEneaney 1988, Hendricks 1991), and in the Wallowa Mountains of northeast Oregon (Gabrielson and Jewett 1940). Whether the new Idaho records reflect a recent increase of the breeding population, as in the Sierra Nevada of California (Miller and Green 1987), is indeterminable.

Late September and October may be the time of peak pipit movement through Idaho and adjacent regions becuase the species waits to migrate until it completes its postnuptial molt, which occurs in August and September (Bent 1950, Verbeek 1973).

The winter absence or extreme rarity of American Pipits in northern and central Idaho is consistent with their avoidance in the western United States of dry-belt pine forest (Root 1988). Numbers of wintering pipits in southern Idaho do not appear to be governed by weather or elevation. Root (1988) found that in the eastern United States the subspecies *A. s. rubescens* winters in areas of average January temperature greater than −1° C, but in the western United States pipits are hardier, wintering in areas with minimum January temperatures as low as −7° C.

Pipits appear to winter in southern Idaho randomly. The variation recorded on CBCs may be due in part to the counts themselves. However, the pattern of one or a few pipits some winters and many pipits in a few winters is similar to what Burleigh (1972) found in Lewiston, what I have observed at Lake Lowell, and what Littlefield (1990) found at Malheur National Wildlife Refuge, southeastern Oregon. Erratic annual fluctuations have also been found in sparrows wintering in the northern Great Basin (Laurance and Yensen 1985) and Snowy Owls (*Nyctea scandiaca*) wintering on the Great Plains (Kerlinger and Lein 1988). In Europe, the closely related Water (*Anthus spinoletta*) and other wintering pipits responded almost immediately to a new food source caused by canal dredging (van Ardenne 1986), and the American Pipits I observed in late October 1976 were directly behind a plow. Numbers of American Pipits wintering in Idaho may reflect the species' ability to respond quickly to erratic food sources.

It is possible that wintering of pipits in southern Idaho is recent. Before the 1970s there were few ornithologists in winter in southern Idaho, but

Davis (1934) spent 1919–1921 in the Rupert area, and Pierce Brodkorb collected numerous rare and uncommon winter birds throughout southern Idaho in the early 1930s (Burleigh 1972). Both failed to record pipits at this season. Earlier in the century, however, pipits were known to winter in both southeastern Oregon (Gabrielson and Jewett 1940) and the Ogden Valley, northeastern Utah (Bent 1950), so I suspect the lack of early records in southern Idaho was due to the paucity of observers, not pipits.

SUMMARY

In Idaho, American Pipits breed in the Pahsimeroi, Lemhi, Lost River, and Sawtooth mountains, and probably in the Beaverhead, Henry's Lake, and Salmon River mountains. Migrating pipits sometimes concentrate in the thousands in Idaho and adjacent areas in late September and October. In winter, pipits are absent from northern Idaho and adjacent regions, extremely rare in central Idaho, and erratic but occasionally numerous in the southern part of the state. There are no significant correlations between numbers of pipits on southern Idaho Christmas Bird Counts and elevation, snow cover, mean December precipitation, or mean December temperature. There are no significant differences in pipit numbers between different Christmas Bird Count areas. In one year, 1986, numbers of pipits were significantly higher than in many other years from 1978 to 1991, but this was probably due to one exceptionally high count at Twin Falls.

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TAXONOMIC STATUS OF THE CALIFORNIA GNATCATCHERS OF NORTHWESTERN BAJA CALIFORNIA, MEXICO

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The California Gnatcatcher (*Polioptila californica*) was first described as a new species by Brewster (1881) from specimens collected at Riverside, California. Later, Grinnell (1926) merged it with *Polioptila melanura*, as a subspecies. Phillips (1980) and Rea (1983) considered it a different species, and Atwood (1988), in a taxonomic revision of the black-tailed gnatcatcher complex, demonstrated that the two forms are sympatric in Baja California on the east side of the central peninsula (29°–31° N), have distinctly different vocalizations, and mate non-randomly. Therefore, he concluded that they were different species. The California Gnatcatcher ranges from the southern tip of the peninsula north to about 31° N. From there northward it is restricted to the Pacific coastal area as far as Los Angeles and Riverside, California.

The California Gnatcatcher is a polytypic species, that is, geographic variation in it has been expressed by the naming of subspecies. The northernmost subspecies, nominate *californica* as traditionally understood (American Ornithologists' Union 1957, Wilbur 1987), ranges from 30° N in Baja California to southern California (San Diego, Orange, Los Angeles, and Riverside counties). In examining the few fresh-plumaged (fall–winter) specimens from northwestern Baja California, however, we found that they did not seem to be nominate *californica*, although they also differed from those of the central peninsula. We did not know whether these differences, through a north–south distance of 360 km, were part of a gradual transition or a stepped cline. Many other sedentary birds vary geographically within this area. Therefore we undertook a more intensive study of the California Gnatcatcher's variation in northern Baja California with newly collected specimens.

TAXONOMIC HISTORY

The first additional subspecies of the California Gnatcatcher to be named was *P. c. margaritae* Ridgway, 1888, described from Isla Margarita, Baja California Sur (24°25' N). It was considered by Grinnell (1926, 1928) to range north to 29° 30' N. In 1926, Grinnell segregated the population from the Cape region, Baja California Sur, as *P. c. abbreviata*. Van Rossem (1931) considered *abbreviata* indistinguishable from *margaritae*, but described *P. c. nelsoni* from Bahía de San Francisquito, on the coast of the Sea of Cortez, 28° 26' N. This subspecies was said to be intermediate in color and size as well as range between *californica* and *margaritae*. The subspecific name *nelsoni* was preoccupied by *P. nelsoni* (= *P. caerulea*

nelsoni) Ridgway, 1903, and van Rossem himself renamed the subspecies as *P. c. pontilis*.

This was the taxonomy accepted in the fifth edition of the American Ornithologists' Union's checklist (1957), which gave the distribution of this intermediate form as from Bahía de San Bartolomé, 27°40' N, on the west coast, San Ignacio, 27°17' N, in the interior, and Bahía de San Francisquito, 28°26' N, on the Gulf of California, south at least to San Bruno, lat 27°9' N.

Atwood (1988), in his analysis of the distributional limits of the members of the black-tailed gnatcatcher complex, commented briefly on the variability found in the peninsula. He concluded that only two forms should be admitted, *P. c. californica* and *P. c. margaritae*. He reported an abrupt transition in many characteristics at about 25° N but only a slight clinal variation to the north. However, in spite of its broad title, Atwood's (1988) monograph primarily addresses the issue of species limits (see summary, p. 67), which it does admirably. The problem of geographic variation within the range of the segregated species *P. californica* is only incidentally, and not meaningfully, addressed. In a later work, Atwood (1991) recognized three subspecies: nominate *californica*, occurring from the northern limit of the species to about 30° N, *margaritae* between approximately 24° and 30° N, and *abbreviata* south of 24° N.

Phillips (1991:25-26) also addressed the taxonomy of *Polioptila californica*. He too considered the nominate subspecies *P. c. californica* to range south to 30° N. He tentatively recognized *P. c. pontilis* in the central peninsula, and *P. c. margaritae* from about 27° N southward, synonymizing *P. c. abbreviata* with a query. He could not agree with Atwood's (1988) abrupt transition at 25° N. Under "remarks" on the nominate (northernmost) race, Phillips stated, "Geographic variation within these dark [northern] populations is indicated; need I repeat endlessly, 'There are few clean, fresh-plumaged specimens'? Sorry." At least two subspecific taxa are represented south of 30° N. Therefore we will use the name *pontilis* as traditionally understood (A.O.U. 1957, Phillips 1991).

METHODS

The field work for this study was conducted in the northwestern part of the state of Baja California, Mexico, between the international border and El Rosario. The vegetation is composed of Mediterranean communities: coastal sage and maritime succulent scrub, near the coast, and chaparral, farther inland.

We collected 40 specimens from 19 localities between 16 January and 27 February and again in December 1991. Some spring visits were made to determine if there was a replacement of the individuals that had been removed. The gnatcatchers were collected with mist nets. At first we attempted to attract the birds with a tape recording. Later we used the recording to find the birds, then herded them into the net. Captured birds were sacrificed or released. We removed for measurement one outer rectrix from most males that were released. This also enabled us to recognize them subsequently in the field. The collected birds were prepared as study skins

by Philip Unitt (San Diego Natural History Museum), without chemical preservatives.

These specimens were compared with specimens of the two neighboring subspecies, *P. c. californica* and *P. c. pontilis*, from the following collections: American Museum of Natural History, New York (AMNH), California Academy of Sciences, San Francisco (CAS), Carnegie Museum of Natural History, Pittsburgh, Denver Museum of Natural History, Los Angeles County Museum of Natural History (LACM), Museum of Vetebrate Zoology, University of California, Berkeley (MVZ), San Diego Natural History Museum (SDNHM), University of California, Los Angeles (UCLA), and Western Foundation for Vertebrate Zoology, Camarillo. We compared a total of 72 females and 81 males from the ranges of these two forms as traditionally defined. Additionally, we compared 17 males and 13 females of *P. c. margaritae*.

In analyses of gnatcatchers, many variables have been measured (see Atwood 1988:5–8). Of these, only the following have been found taxonomically relevant (Atwood 1991, Phillips 1991, this study): darkness of both upperparts and underparts, brown wash (back, flanks, crissum) of females, amount of white in the tail, and tail length. Bill size might be a significant variable in the southern quarter of the species' range, but it was not significant within the area of our study.

The majority of museum specimens of the California Gnatcatcher are males, since they are more responsive on territories and easier to collect than females. However, geographic variation in this species is greater in females, as in many other passerines, for example, thraupines, icterines, emberizines, and carduelines (Rea 1983:122).

We attempted to quantify plumage color by means of a spectrophotometer but found that this instrument failed to give consistent readings, even of a single specimen. The spectrophotometer, designed to measure the colors of flat and uniform surfaces, seems ill suited for the variable texture of feathers. Therefore we made our comparisons visually, using only natural light from a north-facing window or from an east-facing window when the sky was overcast. For color comparisons we used Ridgway's (1912) and Smithe's (1975) standards.

Unfortunately, many skins from the northern end of the species' range (Los Angeles, Riverside, San Bernardino counties) are severely soiled (see also Rea and Weaver 1990:92–94). Most of these were taken early in the twentieth century and have soot-stained plumage. To be sure that we were comparing genetic differences, not artifacts of industrialization, we had to exclude over half of the fall/winter specimens from southern California from analysis. A list of these excluded specimens is available from the Birds and Mammals Department, San Diego Natural History Museum. The ultimate norm for evaluation was seven clean early fall specimens collected in the early 1980s by Atwood and Rea (LACM, UCLA, SDNHM). We also excluded worn specimens taken from April, occasionally March, through August. Insofar as possible we segregated recently taken specimens (12 years or less museum age) from more ancient skins. However, in this species, foxing (color change associated with time after preparation) is slight and seems restricted largely to the gray underparts, with little or no

apparent change in brown areas (Figure 1). In evaluating the amount of white in the tail, we used only those specimens with evidently adult rectrices (crisp patterns and unfrayed tips).

The specimens collected for this study were deposited in the vertebrate collection of the Escuela de Biología, Universidad Autónoma de Baja California. Later, 24 of them were exchanged with the San Diego Natural History Museum.

RESULTS AND DISCUSION

Within the area studied (the state of Baja California beginning at 28° N northward through coastal southern California) there is a stepped cline in the geographic variation of California gnatcatchers, with three increments, representing three subspecies or races (Figure 2). All populations have reduced white on the tips of the outer pair of rectrices (maximum 4.5 mm) and all are largely gray below, unlike populations south of, at least, 25° 30' N, which have extensive white in the outer rectrices (4.5 mm or more) and are largely white below.

Polioptila c. californica

The northermost step in the cline represents the nominate race, *P. c. californica* Brewster. It is characterized by females with the darkest and

Figure 1. Females of *Polioptila c. californica*, showing lack of evident foxing. Left, three old specimens (MVZ, SDNHM, LACM); right three recent specimens (UCLA, SDNHM).

warmest (more pinkish) brown backs and the most strongly brown-washed flanks and crissum. Their back color is nearest Sepia of Ridgway (1912) and similar to color 23, Raw Umber, of Smithe (1975) but diluted. The ventral browns are near Snuff Brown of Ridgway and similar to color 33, Cinnamon-Brown, of Smithe. In both sexes there is less white on the abdomen than in the race to the south. There is a greater tendency in males to have

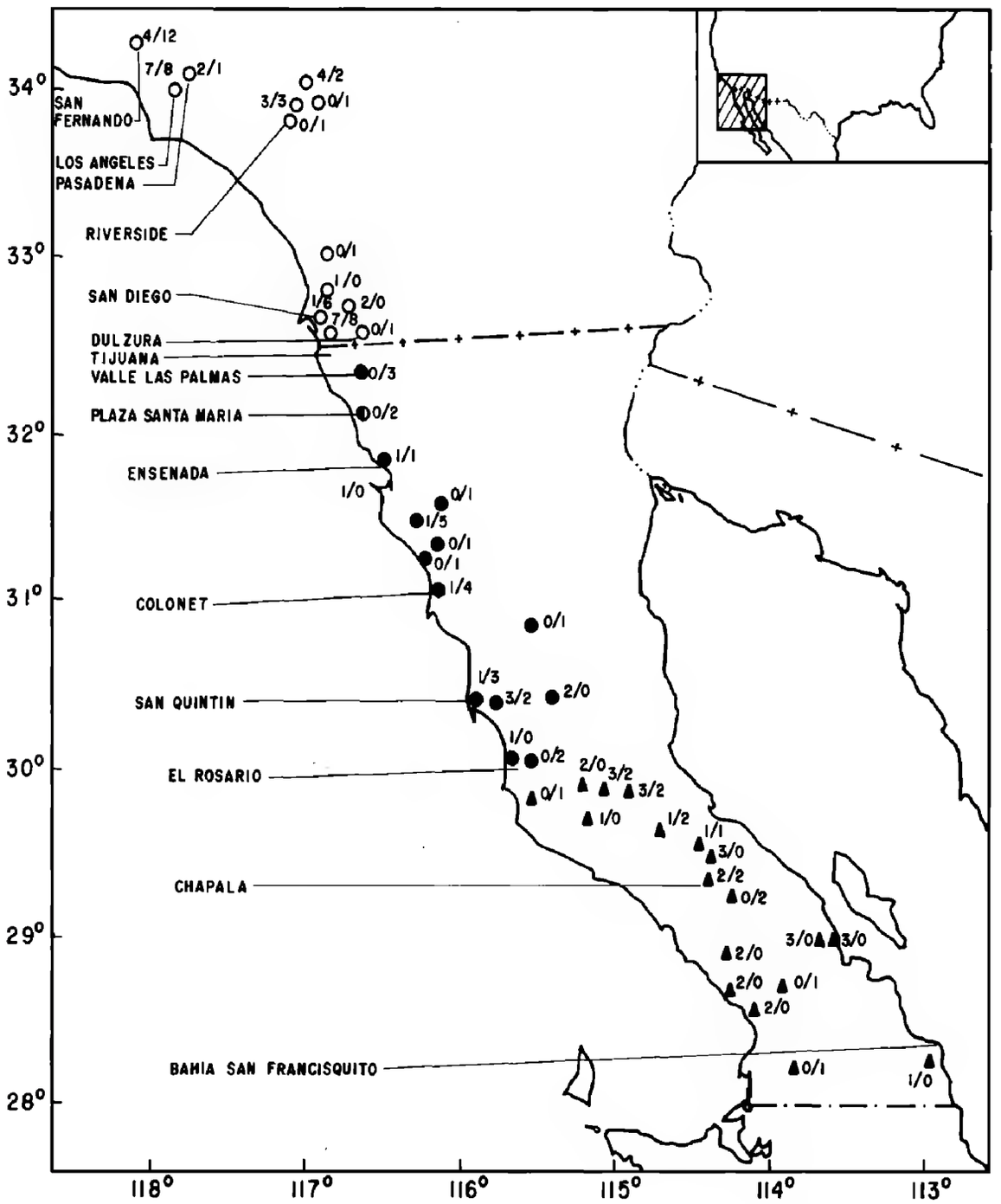

Figure 2. The distribution of California Gnatcatchers in Baja California, Mexico, and California, U.S.A. Open circles, *P. c. californica*; solid circles, *P. c. atwoodi* subsp. nov.; half-filled circles, intermediates between the above two; triangles, *P. c. pontilis*. Numbers indicate numbers of males, then females, examined from each locality. Some localities in close proximity have been lumped.

a dilute brown wash on the back (22 of 25 clean specimens) than in the next race.

The following specimens document the known southern limits of the nominate race: along the coast, a female taken in Baja California 5 miles (8 km) south of monument 258, the westermost international boundary marker (MVZ 52719, 1 January 1928). Three females and two males taken in the Tijuana River valley just north of the border in October 1917 are also good *P. c. californica* (UCLA 25370, 25371, 25379, 25378, AMNH 758890). Both males have a brown wash on the back. Farther inland, *californica* is represented by a female from Dulzura, San Diego Co. (AMNH 377606, 26 October 1891). This specimen is shown in Figure 3.

The next step in the cline is undescribed. The population of northwestern Baja California may be known as

Polioptila californica atwoodi subsp. nov.

Types. Adult female, adult or possibly immature female, and adult male, SDNHM 48443, 48444, and 48442, respectively. Collected 6.5 to 7 km west of Colonet on the road to San Antonio del Mar, Baja California (31° 06' N) by Eric Mellink, prepared by Philip Unitt. Tail lengths 48.4, 50.15, and 52.6 mm, respectively. Weights 5.25, 5.65, and 5.7 grams, respectively.

Description. Similar to *P. c. californica* in size and tail markings, but in females back paler and grayer, less brown, between Brownish Olive and Olive-Brown of Ridgway, similar to color 33, Cinnamon-Brown, of Smithe (Figure 3); flanks and crissum grayer, less brownish, the color tending more toward dilute Tawny-Olive of Ridgway, similar to color 29, Brownish Olive, of Smithe (Figure 4). In fresh plumaged males, backs usually clear gray (2 of 11 with a faint brownish wash) (Figure 5). There is a strong tendency for the secondary edgings to be whiter in *atwoodi*, duller and buffier in *californica*. In both sexes, darker gray, both above and below, than in *P. c. pontilis* (Figures 6, 7).

Range. From Río de las Palmas and Valle de las Palmas (30 km SE of Tijuana) in the interior and at least Punta Banda along the coast south to Arroyo El Rosario, 32° to 30° N. The extension of this race farther north in the interior may be associated with the dryer climate of the area (170 mm rainfall in Valle de las Palmas vs. 270 in Tijuana, García 1973).

Habitat. Nominate *P. c. californica* inhabits soft chaparral or coastal sage scrub (*sensu* Westman 1983) with little vertical stratification except for scattered Lemonadeberry bushes (*Rhus integrifolia*) and Laurel Sumacs (*Malosma laurina*). Oberbauer (1992) estimated that southern California has lost between 80 and 90% of its total coastal sage scrub to agriculture and urbanization. *P. c. pontilis* occurs in Sonoran Desert vegetation with microphyllous legumes, cacti, the Creosote Bush (*Larrea tridentata*), and other highly xerophilous plants.

Between these extremes, *atwoodi* is restricted to the coastal sage scrub and maritime succulent scrub communities, nearly matching the distribution of Westman's (1983) "coastal succulent scrub." Approximately 107 plant species are endemic to this area (Oberbauer 1992), and at least 12

Figure 3. Female California Gnatcatchers, dorsal view. Left, *P. c. atwoodi*; right, *P. c. californica*. Note the darker and more extensive brown of *P. c. californica*.

Figure 4. Female California Gnatcatchers, ventral view. Left, *P. c. atwoodi*; right, *P. c. californica*. Note darker and more extensive brown wash of flanks, belly, and crissum of nominate *californica*.

polytypic bird species reputedly have differentiated subspecific forms here (A.O.U. 1957).

In northwestern Baja California the coastal sage scrub communities are more vertically stratified than in the U.S.. Two species in particular contribute to this: the Parry Buckeye (*Aesculus parryi*) and the Chaparral Ash (*Fraxinus trifoliata*). The Coastal Agave (*Agave shawii*), also gives the habitat a characteristic appearance. Frequently the two southern California dominants of gnatcatcher habitat, the Coast Sagebrush (*Artemisia californica*) and Flat-top Buckwheat (*Eriogonum fasciculatum*), are only the fourth or fifth most abundant woody species, and sometimes, in the south, they are an insignificant component of the community or absent. The abundance of arboreal lichens (especially on the Cliff Spurge, *Euphorbia misera*) in the southern half of this area indicates air moister than in the northern half or in California. Exceptions to this general habitat characterization are at two marginal localities, Valle de las Palmas and San José de Meling, where the habitat had some elements of hard chaparral.

Although in some areas of northwestern Baja California gnatcatchers are common and the territories seem to be tightly packed, in other areas of what appeared to us excellent habitat we were unable to to locate the species, even by playing taped recordings on repeated visits. Thus it is not possible to estimate the numbers of *atwoodi* on the basis of available habitat.

Figure 5. Male California Gnatcatchers, dorsal view. Left, *P. c. atwoodi*; right, *P. c. californica*. Note only slightly olive-brown wash on back of *atwoodi* in contrast to more extensive, browner wash of *californica*. Recently collected specimens of *californica* on top and bottom, showing lack of evident foxing.

The distinctive habitat occupied by *atwoodi* "is rapidly being developed with condominiums, campgrounds, and resort housing, mostly for a U.S. tourist [trade]. Lands that are not being converted to these uses are being converted to agricultural uses" (Oberbauer 1992). Grazing, burning, and off-road recreational vehicles are additional factors in habitat degradation in this area.

Etymology. We name this subspecies in honor of Jonathan L. Atwood, who resolved the relationships between the gnatcatcher species *Polioptila melanura* and *P. californica* and has contributed so much to the conservation of California Gnatcatchers in the U.S.

Polioptila c. pontilis

South of the range of *P. c. atwoodi*, there is a second abrupt step in characters, matching an equally abrupt habitat transition to Sonoran Desert vegetation. This population is *P. c. pontilis* van Rossem. It is paler gray above (Figure 6) and whiter below than the two northern races. The whiteness of the entire underparts (throat, chest, belly) is especially noticeable. The flanks and crissum of *pontilis* are less strongly washed with brown than in either *atwoodi* or nominate *californica* (Figure 7). This brown wash is near Saccardo's Brown of Ridgway (1912).

All specimens we have seen southward to the state line (28° N) are *pontilis*. Unlike Phillips (1991:26) and Atwood (1991) we find *pontilis* readily separable from *P. c. margaritae* Ridgway. The latter is paler, even whiter below, and has extensive white in the outer rectrices. However, too few useful specimens exist in collections to resolve the racial taxonomy of California Gnatcatchers south of 26° N. Adequate samples are needed from the mainland as well as from islas Margarita, San José, and Espíritu Santo to determine if more than one race occurs in the Cape region.

Intergrades

Within the race *atwoodi* we find no indication of clinal variation: females from the northern part of the range in Valle de las Palmas are just as pale and olive brown as those from the river bed soutneast of El Rosario.

The only place where extant specimens demonstrate intergradation between nominate *californica* and *atwoodi* is along the coast in extreme northwestern Baja California. A female (E. Mellink 91-40, 8 December 1991) taken along the coast near Plaza de Santa María, 43 km south of the border, has the brown of the back and flanks intermediate between the warm brown tone of recently taken *californica* and the olive tone of *atwoodi*. It is darker above and below than *atwoodi*. Another female taken from this locality (SDNHM 48453, 29 February 1991) appears to have rich browns on the lower flanks and lower back but was undergoing extensive molt, so the remainder of the specimen could not be evaluated.

Thirty-five kilometers farther south, a female (SDNHM 48439, 16 January 1991) taken on Cerro El Vigía in Ensenada is dark in the grays, above and below, like the nominate race, but it is nearer the darkest examples of *atwoodi* in olive-brown tones (for example, syntype SDNHM 48443, near Colonet, and SDNHM 48450, near San Quintín). It may represent the

southern extent of some nominate *californica* influence along the coast. As noted, the three females we took in the interior at Valle de las Palmas are typical *atwoodi*, although the locality is only 32 km south of the Dulzura specimen noted above.

Atypical Specimens

Among the 153 specimens we examined, excluding the 3 intergrades, we encountered an occasional specimen that was not typical of the local race (4% of 75 in *californica*, 7.7% of 34 in *atwoodi*, and 2.3% of 44 in *pontilis*).

Range of californica. Two females from Los Angeles Co. (AMNH 94797, 14 November 1897, Claremont; LACM 12776, 1 December 1895, San Fernando) are both pale, with the brown tones of back and underparts similar to those of *atwoodi*.

Another female, from Riverside (CAS 56647, 29 December 1887) is exceptionally pale. It is in lax, fresh plumage. The browns, both above and below, are paler than in some *pontilis*, which it most closely resembles. The head, nape, upper back, and chest are far too pale for *atwoodi*. In 1980 Phillips annotated this as "(*lucida* × *californica*)" (see also Phillips 1991:25); *lucida* is the race of *Polioptila melanura* occupying the Sonoran Desert east of *P. californica*. This odd specimen may be an interspecific hybrid. However, the tail shows only minimal white (2.1 mm). *P. m. lucida* usually has 7.5 mm or more of white on the inner web of the outer rectrix and has the entire outer web white, reaching the rachis.

Range of atwoodi. One female from San José [de Meling], 31° N, 2500 feet (750 m) (MVZ 46531, 7 October 1925) has the brown of the back and flanks as dark and pinkish as in nominate *californica*. We collected a female here (SDNHM 48454, 21 February 1991), although somewhat worn and molting, with the colors of *atwoodi*.

Another female, from El Valle de la Trinidad, 2500 feet (750 m) (MVZ 50418, 7 December 1926), has rich and dark browns. Even the rectrices are brown rather than blackish, perhaps owing to chemical change. Atwood (1988:18) found both species of gnatcatcher at this locality, where the Crissal (*Toxostoma crissale*) and California (*T. redivivum*) thrashers also overlap.

Range of pontilis. All the browns of one female from Chapala, 29°21' N (SDNHM 13749, 16 October 1930) are dark, as in *P. c. californica*. The grays and whites of the underparts can be matched by paler, clean specimens of the nominate race, such as UCLA 37981 (Banning, Riverside Co.) and MVZ 9981 (San Fernando, Los Angeles Co.).

The aberrant specimens from Chapala and El Valle de la Trinidad could be vagrants from the north. Although the California Gnatcatcher is considered sedentary, limited vagrancy might take place. It seems more likely to us that these represent variants of the local populations. Alternatively, their unusual colors could be an artifact of chemicals used in preparation: the atypical skins in the north are a century old.

Figure 6. Female California Gnatcatchers, dorsal view. Left, *P. c. pontilis*; right, *P. c. atwoodi*. Note that *atwoodi* is darker gray, especially on crown, with more brown wash on back.

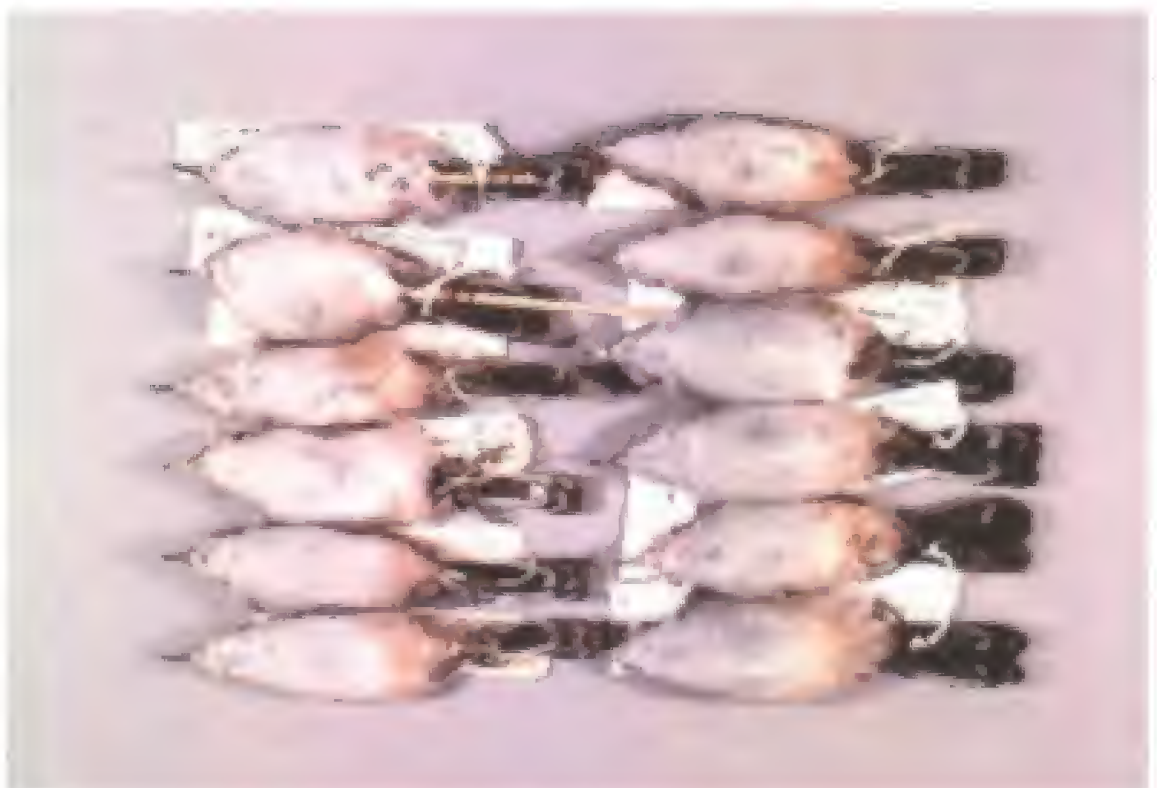

Figure 7. Female California Gnatcatchers, ventral view. Left, *P. c. pontilis*; right, *P. c. atwoodi*. Note whiter chest of *pontilis* and grayer underparts of *atwoodi*.

SUMMARY

The California Gnatcatchers of northwestern Baja California represent a previously undescribed subspecies, hitherto included under *Polioptila c. californica*, for which we propose the name *P. c. atwoodi*. Ranging from about Ensenada and Valle de las Palmas south to El Rosario, it differs from nominate *californica* in the paler, grayer (less brownish) back, flanks, and crissum of females. Males differ in only rarely having the faint brown tinge to the back frequent in nominate *californica*. From *P. c. pontilis*, the subspecies of central Baja California, both sexes of *atwoodi* differ in their darker upperparts and gray, not whitish, underparts.

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California Gnatcatcher
Sketch by Tim Manolis

NOTES

FURTHER OBSERVATIONS OF HEAD-DOWN DISPLAYS BY BROWN-HEADED COWBIRDS

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Cowbirds sometimes appear to solicit preening both intra- and interspecifically; this head-down preening-invitation display has been well described by Chapman (1928), Selander and La Rue (1961), Selander (1964), Rothstein (1980), and Post and Wiley (1992). A Brown-headed Cowbird (*Molothrus ater*), for example, will approach another bird, point its bill downward, and freeze, presenting the crown and nape area. The recipient of this display may respond by ignoring, pecking at, fleeing from, or preening the Brown-headed Cowbird. A variety of explanations for the function of this behavior have been suggested, most of them dealing with assessing and establishing hierarchial social relationships such as subordination and dominance. Selander and La Rue (1961) hypothesized that head-down displays reduce aggression from potential host species. Scott and Grumstrup-Scott (1983) also proposed that head-down displays are for appeasement but benefit the displayer in feeding and roosting interactions. Rothstein (1980) concluded that the head-down display is itself aggressive, allowing the displayer to threaten or assess the status of other individuals. In this situation, the recipient may misinterpret the intent of the threat display as submissive, and respond inappropriately by preening the Brown-headed Cowbird (Rothstein 1980). Head-down displays may even have more than one function, depending on the context in which they are used. Other authors suggest that the head-down display may have no biological significance or functional value (Dow 1968, Friedmann 1963).

I observed head-down displays by both male and female Brown-headed Cowbirds directed toward a female Rusty Blackbird (*Euphagus carolinus*). The Rusty Blackbird was known to be present from 13 February through 1 March 1992 at King Salmon, Humboldt County, California (Yee et al. 1992). Rusty Blackbirds are casual in fall migration and accidental in winter in northwestern California (Harris 1991). The Rusty Blackbird and Brown-headed Cowbirds were feeding and loafing in and around a residential trailer park in a mixed flock of about 100 birds, including Red-winged Blackbirds (*Agelaius phoeniceus*) and Brewer's Blackbirds (*Euphagus cyanocephalus*). Between 14 and 25 February 1992 I watched this flock intermittently for a total of about 4 hours, observing the Rusty Blackbird specifically for 1.5 hours. I noted eight head-down displays, all by Brown-headed Cowbirds directed toward the Rusty Blackbird. Four of these displays resulted in allopreening, lasting from 1 to 4 seconds. All episodes ended when the Rusty Blackbird fled. I also observed the mixed flock, minus the Rusty Blackbird, for about 4 hours between 7 and 21 February 1993. I noted one head-down display by a female Brown-headed Cowbird directed toward and ignored by a male Brewer's Blackbird.

During studies of captive flocks, Selander and La Rue (1961) and Rothstein (1980) found that Brown-headed Cowbirds displayed more often to unfamiliar individuals. My observations of the mixed flock suggest the same is true for wild birds. This may be because new flock members are still being assessed and integrated (Scott and

Grumstrup-Scott 1983). Another explanation is that resident members of a flock may eventually become habituated to the displays, while newcomers such as the Rusty Blackbird are unknowingly stimulated to participate in nonreciprocal allopreening. Thus, head-down displays may simply be an attempt to coax the recipient into preening or scratching a less accessible area of the body. This comfort or maintenance function may explain why the act of being preened acts as a stimulus for a Brown-headed Cowbird to display more (Scott and Grumstrup-Scott 1983). Still another explanation is that the Brown-headed Cowbirds were displaying more to the Rusty Blackbird because they were able to dominate this unusual newcomer (S. Rothstein pers. comm.). This hypothesis is supported by experimental evidence that frightened or submissive behavior (which I have observed in many vagrant birds) elicits head-down behavior by Brown-headed Cowbirds (Rothstein 1980).

While intraspecific allopreening is not common in Brown-headed Cowbirds and other icterines, several of these species are known to exhibit similar head-down behaviors that lead to intraspecific allopreening (Harrison 1965, Webber 1983, Post and Wiley 1992). This supports the idea that the interspecific head-down display had its origin as an intraspecific preening interaction (Webber 1983). Alternatively, the display may have originated as an intraspecific interaction not related to preening (S. Rothstein pers. comm.). Head-down displays by Brewer's Blackbirds followed by preening from Red-winged Blackbirds have also been documented (Verbeek et al. 1981).

Because interpreting animal behavior is difficult, the true significance of the head-down display remains open to conjecture. Increased observer awareness about this interesting behavior may encourage further investigation and reporting of head-down displays from a variety of situations. Brown-headed Cowbirds also perform other types of displays (Selander 1961, Orians 1985), however, so observers should exercise care in categorizing them.

I thank Brooks B. Allen for finding and documenting the occurrence of the Rusty Blackbird, and David Fix, William Post, and Stephen I. Rothstein for reviewing earlier drafts.

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NORTHERN SAW-WHET OWL IN THE SIERRA SAN PEDRO MÁRTIR: FIRST BAJA CALIFORNIA RECORD

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On the evening of 5 July 1993, we discovered a Northern Saw-whet Owl (*Aegolius acadicus*) at approximately 2300 m elevation in the Sierra San Pedro Mártir, Baja California (Norte). We found the bird near kilometer marker 86 while owling along the main road through Parque Nacional Sierra de San Pedro Mártir, about 2 km east of La Corona de Arriba. At this point the main road from the west descended steeply into a canyon separating La Corona de Arriba from the higher meadows at Vallecitos to the east. The habitat was relatively open mixed coniferous forest composed of Jeffrey Pine (*Pinus jeffreyi*), White Fir (*Abies concolor*), and Sugar Pine (*Pinus lambertiana*), with little ground cover. A small grove of Quaking Aspen (*Populus tremuloides*) occupied the canyon bottom. It was cool and still under clear skies, with a nearly full moon just above the horizon when we found the owl.

At approximately 2200 hours, the owl first responded to our whistling with a single loud high-pitched "scree" note. In our experience, this response is typical of the Saw-whet Owl and we tentatively identified the bird from this note. We were convinced of its identity only after the owl began to give the normal song of this species. Over the next half hour we heard an estimated six bouts of singing as the bird moved over an area of about 0.5 ha. Singing consisted of a monotonous series of single notes at a medium pitch, given at a rate of approximately two notes per second. Singing bouts lasted 1 to 4 minutes.

We heard the bird from as close as 6–7 m and tried to see it with flashlights, but the bird remained consistently out of sight in the dense foliage of firs where we pinpointed the sound several times at heights of 4–7 m. Nevertheless, we saw it twice, briefly. Erickson saw the bird in silhouette, without light, as it swooped toward his face in response to squeaking and squealing sounds. He noted only its small size and compact shape. Barron saw what was apparently the bird, also in silhouette only, and without light, as it flew over the road above him.

Barron and Erickson are very familiar with the vocalizations of the Northern Saw-whet Owl from dozens of encounters with the species over the previous 25 years, the most recent in March 1993. Erickson's experience is limited to California, whereas Barron's ranges from the western U.S. to the prairie provinces and the Appalachians. Wurster was aware of the typical song but had never heard the species in life. This individual sounded consistently "hoarser" (less clear) and softer than most birds we had previously heard, but the pattern and pitch of the calls were perfect, and left no doubt in our minds as to the identity of the bird. "Hoarse" individuals of several species of owls have been heard on occasion in California (J. Winter pers. comm.), and R. Stallcup (in litt.) has heard a single Saw-whet Owl in California change from hoarse to clear notes in mid-series. The cause and/or significance of this is unknown to us.

The only likely source of confusion with vocalizations of this species is the Northern Pygmy-Owl (*Glaucidium gnoma*). Except in the cape region, home of the distinctive endemic subspecies *G. g. hoskinsii*, the Northern Pygmy-Owl has not been adequately documented in Baja California (Grinnell 1928, AOU 1983, Wilbur

1987, Howell and Webb in press). We do not consider Wauer's (1992: 86) brief mention of a bird heard only (Wauer pers. comm.) or the map of this species published by NGS (1987) to be conclusive. Three things, in our experience, distinguished our bird from a Northern Pygmy-Owl: (1) although the pitch of individual Pygmy-Owl notes can be very similar to those of the Saw-whet Owl, and Pygmy-Owls can give notes in rapid succession for a short period, we have never heard them give identical notes in this manner for minutes at a time as is typical of the Saw-whet Owl; (2) we have not heard anything like the "scree" note described here from the Pygmy-Owl; and (3) Pygmy-Owls normally call at twilight, or even in daylight, but rarely late at night.

Northern Saw-whet Owls are found across much of North America from Alaska south to Oaxaca, but there are no previous records from Baja California (Grinnell 1928, AOU 1983, Wilbur 1987, Howell and Webb in press). The species is rare to uncommon and local in montane southern California, including the Palomar and Cuyamaca mountains of San Diego County (Garrett and Dunn 1981, Unitt 1984). Thus, the Sierra San Pedro Mártir represents a range extension of approximately 250 km. Habitat suitable for this species is extensive in the Sierra San Pedro Mártir, and future records may reveal a breeding population. An alternative explanation is that our bird was merely the remnant of an irruption of Saw-whet Owls into the area. Monson and Phillips (1981) stated that in Arizona "irruptions in some winters bring large numbers to a region, where they may stay for a few years and nest." Saw-whet Owls were unusually numerous in the Kayenta area of Navajo County in northern Arizona in spring and summer 1993, and a rare lowland record was established in the Phoenix area in late winter 1993 (G. H. Rosenberg pers. comm.), so our record may be related. Similar irruptions have not been detected in southern California, although apparent fluctuations in numbers in the San Gabriel Mountains could be the result of them (K. L. Garrett pers. comm.).

The Northern Saw-whet Owl is but the latest of a number of species first found summering in the Sierra San Pedro Mártir in the last decade (R. E. Webster and Wurster pers. obs.; Howell and Webb 1992). Additional investigations will likely reveal some of these species in the Sierra Juarez as well.

We thank Kimball L. Garrett, Steve N. G. Howell, M. W. (Bill) O'Connell, Rich Stallcup, Philip Unitt, and Jon Winter for providing helpful comments on various drafts of this note, and Robert A. Hamilton for logistical support.

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Accepted 22 October 1993

Northern Saw-whet Owl *Lithograph by Linda Schliesman Erickson*

BOOK REVIEW

TIM MANOLIS, 808 El Encino Way, Sacramento, California 95864

The Marin County Breeding Bird Atlas—A Distributional and Natural History of Coastal California Birds. 1993. W. David Shuford. California Avifauna Series 1. Bushtit Books, P. O. Box 233, Bolinas, CA 94924. 479 pages. Softcover only. Price: $24.95, plus $3.50 shipping; California residents add $1.81 sales tax. (A 20% discount is being offered on orders of 5 or more copies.)

The popularity of national and regional breeding bird atlases has grown steadily since the 1960s, and a number of California county atlas projects have been launched since the first one, started by Bob Stewart of Point Reyes Bird Observatory for Marin County, in 1976 (see Manolis, *W. Birds* 22:92–94, 1991, for a history of atlas efforts in the state). The publication of the Marin County atlas is thus a significant and long-awaited event in the annals of California field ornithology. Dave Shuford, who took up the Marin project in 1982 and has seen it to completion, has taken a great deal of gentle heat from those of us involved in county atlas projects, anxious to use the Marin results as a benchmark for our own. Well, here they are, awaiting our verdict, tempered by the knowledge that we will soon have to "put up or shut up" ourselves!

I think Dave, from the start, saw the atlas project as a frame upon which to elaborate a much broader vision, adequately summed up in the subtitle to his work. In his preface, he admits as much, noting his original intent to expand both the scope and detail of his supplementary material well beyond what could eventually be accommodated. The result is something more than a breeding bird atlas; indeed, it is a major reference on the birds of the central coast of California, crammed with more information bits per inch than many encyclopedias.

Shuford has done an admirable job of organizing a wealth of ecological information about his central theme, the distribution and breeding biology of Marin County's birds. An introductory section of about 40 pages provides a comprehensive and highly readable frame of reference, detailing Marin County geology and climate, plant communities, history of land use, and breeding phenology. Ten pages on methods follow, followed in turn by 20 pages of discussion of broad patterns of avifaunal composition and biogeography elucidated by the atlas work, culminating in a brief but useful section on conservation applications and identification of local species of special concern.

Most of the book is devoted, of course, to species accounts. One hundred sixty-three species are provided with individual accounts, with another 30 or so of "unclear" or potential breeding status receiving thumbnail sketches in a separate section. Each account consists of a map, a block of data summarizing the dispersion and relative abundance of the species as determined by atlas work, and accompanying text. The text section, which makes up the bulk of each account, is divided into sections on ecological requirements, Marin breeding distribution, and historical trends and population threats.

The maps themselves, although adequate, are perhaps the weakest element. They are small, taking up about a quarter of a page, yet crammed with details (major roads, reservoirs, bold atlas grid lines) that detract from and occasionally make it tricky to find or decipher the tiny symbols for breeding evidence. I urge those who might look to these maps as examples while producing their own atlases to remember that the most important elements on these maps are the symbols delineating the breeding distribution and status of bird species in the county. These symbols should dominate visually over the grid lines and geographic features (roads, rivers, etc.) by being big

and bold and, if possible, in a second color. The grid system and geographic features may best be even deleted from these maps.

The block of data beside each map includes the species' seasonal status, the percentage of grid blocks in which the species was recorded, in total and for each major level (possible, probable, and confirmed) of breeding evidence, a rating of "fine-scale abundance," and indices of overall population size, relative distribution, and confirmability of breeding. These data are calculated and presented slightly differently for colonial waterbirds than for other species.

Beyond the basics of atlasing—plotting the presence or absence of breeding evidence for each block in the grid—atlas projects in North America have varied considerably in the collection and presentation of data on relative abundance, dispersion, etc., of their breeding birds, if indeed they have presented any such data. Shuford has done a very admirable job of dealing with this aspect of the project by drawing from a limited data base and his own vast experience with the county's avifauna to develop his ratings and indices. As he points out, however, his fine-scale abundance rating (FSAR) "qualitatively defines the abundance of a species" and "may be off by plus or minus one (or more?) category." Caution is therefore essential in assigning significant meaning to absolute values of FSAR and the "overall population index," a function of the FSAR, or in attempting to extrapolate or compare these to similar ratings or indices used in other projects.

Most of each species account consists of text, and most of this discusses "ecological requirements." One hundred and fifty-three of these accounts are by Shuford, but a handful were written by regional experts on particular species. It is in this finely detailed, heavily referenced supplementary text that the book expands on the standard atlas format and proves worthy of a wide readership.

Of course, these accounts vary in detail. Species like the Yellow-breasted Chat, a sparse breeder on the margin of its range in Marin County, are subjects of little more than thumbnail sketches. Many common breeding birds of coastal northern California, however, have been intensively studied by staff biologists at Point Reyes Bird Observatory over the years, and Shuford ably summarizes the results of these efforts and the research of others. Similarly, the discussion of historical trends and population threats for each species goes far beyond the boundaries of Marin, encompassing all of California with special emphasis on the central coast.

Tucked away in the back of the book are three appendices with much interesting information, particularly the table of raw data from 10-year's worth of Spring Bird Counts (patterned after Christmas Bird Counts) conducted in Marin County from 1977 to 1987.

Illustrations by Ane Rovetta and Keith Hansen add considerable charm to this book, and Ian Tait's photos are as informative as they are beautiful. The frequently haphazard distribution of photos and sketches, however, is a minor annoyance (e.g., a photo of a Yellow Warbler is four pages and two species' accounts removed from the text for the Yellow Warbler, and a wonderful full-page photo of a Wrentit at the nest fronts the account for the Northern Mockingbird instead of the preceding text for the Wrentit).

The typographical errors inevitable in a volume of this size are few and of little consequence. Production values seem high for a soft-cover volume of this size, and acid-free, recycled paper is used. In summary, aside from the poor treatment of some visual elements, this is a well-crafted book and a fine breeding bird atlas, but these descriptions do not do justice to its full value. Because it contains an enormous amount of information on California's birds, thoughfully presented in an easily digested form, *The Marin County Breeding Bird Atlas* belongs on every western field ornithologist's bookshelf.

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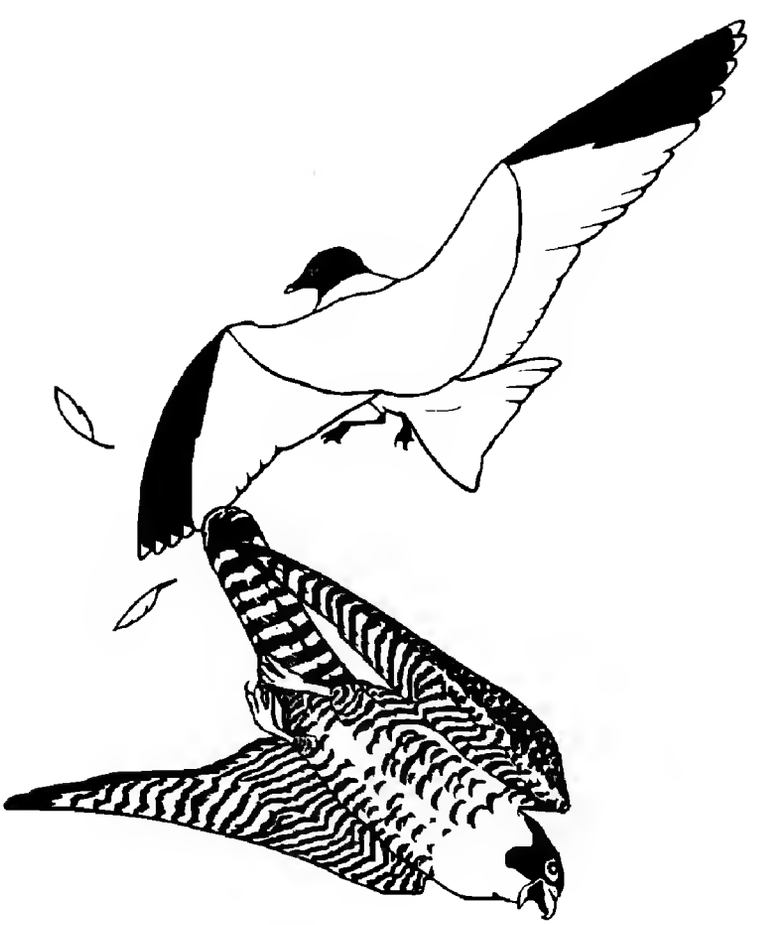

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Cover Photo by © Jamie Simmons of Corvallis, Oregon: Emperor Goose *(Chen canagica)*, Yaquina Bay, Newport, Oregon, January 3, 1993.

Western Birds solicits papers that are both useful to and understandable by amateur field ornithologists and also contribute significantly to scientific literature. The journal welcomes contributions from both professionals and amateurs. Appropriate topics include distribution, migration, status, identification, geographic variation, conservation, behavior, ecology, population dynamics, habitat requirements, the effects of pollution, and techniques for censusing, sound recording, and photographing birds in the field. Papers of general interest will be considered regardless of their geographic origin, but particularly desired are reports of studies done in or bearing on the Rocky Mountain and Pacific states and provinces, including Alaska and Hawaii, western Texas, northwestern Mexico, and the northeastern Pacific Ocean.

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WESTERN BIRDS

Volume 25, Number 2, 1994

BIRDS OF THE PRUDHOE BAY REGION, NORTHERN ALASKA

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This paper summarizes the results of our studies of birds of the arctic coastal plain of Alaska from 1971 to 1993 and numerous published and unpublished reports. Our objective is to synthesize the considerable data accumulated since oil extraction began in the Prudhoe Bay area and to provide a detailed account of all species within three contiguous regions so that future changes in species composition and status may be assessed.

Our primary sources of information were ecological studies of impacts of petroleum resource development undertaken at Prudhoe Bay from 1971 to 1973 as part of the Alaskan Arctic Gas Pipeline Company's effort. From 1974 to 1981, additional study sites were established on the coastal plain, near Franklin Bluffs, and in the coastal foothills under U.S. Energy Research and Development Administration (now U.S. Department of Energy) sponsorship. Several biologists and an increasing number of birders have continued to communicate to us their observations in the Prudhoe Bay area.

REGIONAL SETTING

The area covered by this paper extends from the Arctic Ocean on the north to the crest of the Brooks Range on the south, from the Canning and Ivishak rivers on the east to the Itkillik and Colville rivers on the west. We have divided this sector into three north–south regions: Prudhoe Bay, Franklin Bluffs, and Central Foothills (Figure 1). The Central Foothills region extends from the Brooks Range north to the Sagwon Bluffs and White Hills. The Franklin Bluffs Region includes the area bounded by the northern edge of Franklin Bluffs, which form the east bank of the Sagavanirktok River in that area, and the Itkillik and Shaviovik rivers. The

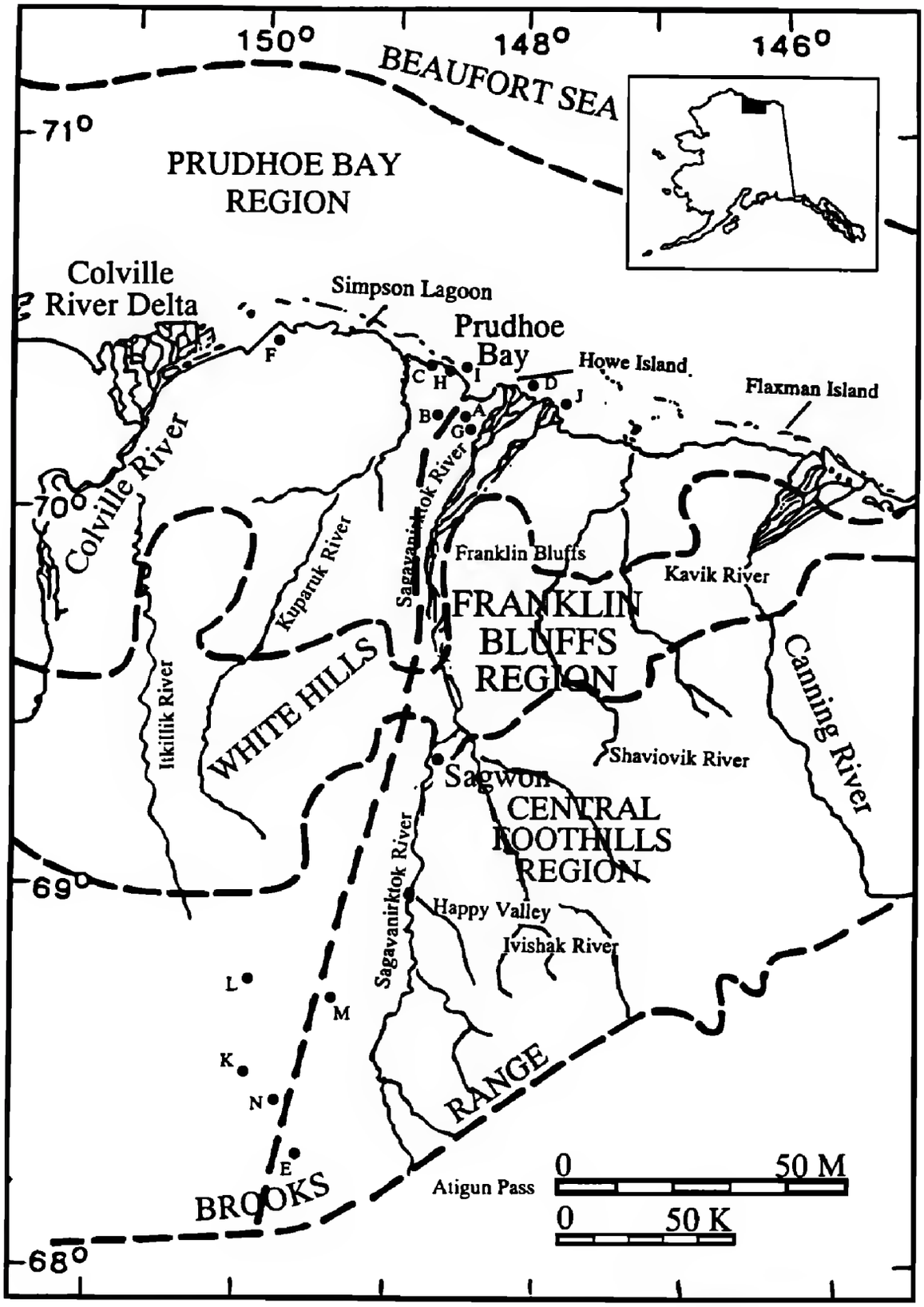

Figure 1. Prudhoe Bay, Franklin Bluffs, and Central Foothills regions. The dashed line from north to south shows the path of the Dalton Highway and Trans-Alaska pipeline. A, Atlantic Richfield Company's Prudhoe Bay operation center; B, British Petroleum's main operation center; C, Point Storkerson; D, Endicott Causeway; E, Atigun Valley; F, Oliktok Point; G, Deadhorse; H, Point McIntyre; I, West Dock; J, Point Brower; K, Galbraith Lake; L, Toolik Lake; M, pump station 3; N, pump station 4.

Prudhoe Bay Region extends south to the northern end of Franklin Bluffs and east to the confluence of the Kavik and Shaviovik rivers. In the Beaufort Sea, the region extends offshore about 55 km to include pelagic, nearshore, and littoral habitats of the continental shelf; it is bordered on the west by the Colville River and on the east by Flaxman Island.

Central Foothills Region

In this the most southern of the three regions, the Brooks Range dominates the landscape. Peaks range from 2134 to 2438 m in elevation, with rugged ridges extending east–west (Figure 2). The low, sparse alpine tundra vegetation of these mountains is composed of lichens, mat and cushion plants, and dwarf shrubs. The northern part of this region is characterized by numerous east–west ridges rising to about 360 m, interspersed with rolling plains and braided streams (Sage 1974). The dominant habitat is tussock-heath tundra, characterized by cottongrass (*Eriophorum vaginatum*), mountain avens (*Dryas integrifolia*), dwarf birch (*Betula nana*), cranberries and blueberries (*Vaccinium spp.*), Labrador tea (*Ledum decumbens*), and other shrubs. Willow (*Salix* spp.) thickets along streams and rivers and local patches of tall brush provide important habitat for passerines. Many areas away from the Dalton Highway, such as the White Hills, remain poorly explored from an avifaunal standpoint.

Figure 2. Spring break-up along the Dalton Highway and Trans-Alaska pipeline, in the Central Foothills region, Brooks Range, Alaska.

Photo by Craig Hohenberger

Franklin Bluffs Region

This region is a narrow transitional area between the wet coastal plain and rolling plateaus and mountains of the Central Foothills. The dominant physiographic feature is the Franklin Bluffs, which rise to 293 m and extend 32 km from north to south (Figure 3). Moderate slopes and relief have produced a mixture of well-drained xeric and mesic tundra and low, wet tundra. Drier areas are vegetated by *Dryas*, *Eriophorum* tussocks, and shrubs. Poorly drained terrain is characterized by wet sedge meadows covered by pioneering herbaceous plants. These mesic habitats are characterized by polygonized and frost-scar tundra. Polygons are low-lying ridges, rising to heights of 0.5 meters, formed from the cyclic arctic freezes and thaws. Frost scars are roughly circular, slightly convex, and composed of fine sandy loam that heaves under certain moisture and freezing conditions.

Dwarf willows are common on rises, and shallow ponds rimmed with the sedges *Carex aquatilis* and *Arctophila fulva* are sparsely distributed throughout the region. From 1976 to 1981, this region's birds were studied by Hanson and Eberhardt (1977–1981), Brink (1978), Jones et al. (1980), Garrott et al. (1981), and McCaffery et al. (1982), at a 100-ha site located 69 km south of Deadhorse (69°41' N, 148°42' W), 0.5 km west of the Sagavanirktok River, and 1.5 km west of the bluffs.

Prudhoe Bay Region

With a relief of <10 m, the coastal plain in the Prudhoe Bay Region is poorly drained, characterized by wet meadows, lakes, and ponds 1–2 m deep (Britton 1957). Walker et al. (1980) thoroughly described the area's landforms, soils, and vegetation. In general, water covers 50–75% of the region (Black and Barksdale 1949), and the land surface is covered by a mosaic of low-centered polygons and wet tundra dotted with ponds 1–2 m deep.

The plain's terrestrial vegetation is dominated by sedges mixed with *Eriophorum*, saxifrages, and louseworts (*Pedicularis* spp.) and underlaid by mosses. Several decumbent and dwarf willows are common on higher ground but are too low for nesting of many passerines. Well-drained sites with lichens, *Dryas*, and heather (*Cassiope tetragona*) are found along stream and river terraces, elevated lake shores, and on pingos (ice-cored hills). Salt marshes, dominated by *Puccinellia phryganodes* and *Carex subspathacea*, and grassy beaches are found intermittently along the shores of Prudhoe Bay and the Beaufort Sea (Figure 4) (Jeffries 1977, Broad et al. 1980, Taylor 1981).

Bergman et al. (1977) distinguished eight types of wetlands and documented their use by loons and waterfowl. Derksen et al. (1981) expanded that data base and demonstrated the applicability of the classification system across the National Petroleum Reserve—Alaska to the west. Connors et al. (1979), Myers and Pitelka (1980), Jones (1980), and Connors (1984) described these habitats' use by shorebirds. Lagoons and barrier islands of sand, gravel, and tundra border the outer coast of the Prudhoe Bay region discontinuously. Barrier islands occasionally support high densities of nesting marine birds (Divoky 1978a,b) and provide impor-

Figure 3. Representative habitat, characterized by *Dryas* and *Eriophorum*, along Franklin Bluffs and the Sagavanirktok River.

Photo by Craig Hohenberger

Figure 4. An abandoned native dwelling in wet tundra of the coastal plain, adjacent to the Beaufort Sea.

Photo by Craig Hohenberger

tant habitats for molting, feeding, and staging birds (Schamel 1978, Johnson and Richardson 1980, Divoky 1984). The central Beaufort Sea coast supports lower diversity and densities of breeding birds than do coasts of other northern seas, such as the Chukchi Sea, because it has few suitable nesting areas and the sea is relatively shallow and unproductive (Divoky et al. 1974).

The Prudhoe Bay Region is by far the most thoroughly studied of the three regions. We studied a Prudhoe Bay site from 1971 through 1980 (Hanson and Eberhardt 1976–1981) and a 100-ha site 20 km south of Prudhoe Bay from 1979 to 1981 (Hohenberger et al. 1980, 1981, 1982). Johnson and Herter (1989) summarized the 249 bird species recorded in the Alaskan and Canadian areas of the Beaufort Sea.

ANNOTATED LIST

One hundred seventy-four species of 28 families had been recorded from our study area as of 1993. The terms we use in describing the status of a species are those of Kessel and Gibson (1978): Resident—a species present throughout the year. Migrant—a seasonal transient between wintering and breeding ranges; in spring, includes species that have overshot their normal breeding range. Breeder—a species known to breed; prefixed by "possible" or "probable" if concrete breeding evidence is unavailable. Visitant—a nonbreeding species; also, in fall, a species not directly en route between its breeding and wintering ranges. Abundant—species occurs repeatedly in proper habitats, with available habitat heavily utilized, and/or the region regularly hosts great numbers of the species. Common—species occurs in all or nearly all proper habitats, but some areas of presumed suitable habitat are occupied sparsely or not at all and/or the region regularly hosts large numbers of the species. Fairly common—species occurs in only some of the proper habitat, and large areas of presumed suitable habitat are occupied sparsely or not at all and/or the region hosts substantial numbers of the species. Uncommon—species occurs regularly, but utilizes little of the suitable habitat, and/or the region hosts relatively small numbers of the species; not observed regularly even in proper habitats. Rare—species within its normal range, occurring regularly, but in very small numbers. "Very" rare is used for species that occur less regularly, not every year, and usually in very small numbers. The regions are abbreviated as PB (Prudhoe Bay), FB (Franklin Bluffs), and CF (Central Foothills). Early and late observation dates are given when significant, but are not available for every species because of sparse observer coverage in early spring and late fall. If a region is not listed in a species account, there are no records for that species in that region.

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Other abbreviations: University of Alaska Museum (UAM), United States Fish and Wildlife Service (USFWS), ARCo (Atlantic Richfield Corporation), BP (British Petroleum), MOC (BP's Main Operation Center), PBOC (ARCo's Prudhoe Bay Operations Center), PS-3 and PS-4 (pump stations), and TAPS (Trans-Alaska Pipeline System).

Gavia stellata. Red-throated Loon. PB: Common breeder. Arrives first week of June; latest record 1 October 1989 (EEB). FB: Uncommon and local breeder. For example, one pair found nesting opposite Franklin Bluffs in 1980 and 1981 (CJH). CF: Rare; two records of breeding, of nests in Atigun Valley in 1980 (GE, PK, JK) and between TAPS PS 4 and Dalton Highway in 1981 (DRS).

Gavia pacifica. Pacific Loon. PB: Common breeder. Earliest arrival 3 June 1991; latest record 2 October 1989 (EEB). Peak abundance 3–9 June (Johnson and Richardson 1981). FB: Uncommon, probable breeder. Earliest arrival date 4 June 1981 (CJH). CF: Common breeder. Earliest arrival date late May 1981 (DRS).

Gavia immer. Common Loon. PB: Rare migrant, observed in small numbers along the coast (Bergman 1974, Pitelka 1974, Derksen et al. 1981, Johnson and Richardson 1981, Garner and Reynolds 1986). Johnson and Richardson (1981) reported small numbers near Simpson Lagoon in spring, suggesting an eastward movement. CF: Uncommon and local breeder. For example, Sage (1974) reported a pair seen in Ribdon Valley in the upper Sagavanirktok basin 29 June 1970, DRS noted the species breeding at Toolik Lake 1977–79, Pamplin (1979) recorded it in Atigun Valley, and GE, PK, and JK saw an individual there on 26 July 1980.

Gavia adamsii. Yellow-billed Loon. PB: Uncommon breeder and migrant onshore, common migrant offshore in spring and fall (Bailey 1948, Johnson and Richardson 1981, Woodby and Divoky 1982, Divoky 1983). Earliest spring record 31 May 1982 and 1983 (Simpson et al. 1982, Renken et al. 1983). Peak abundance 3–9 June (Johnson and Richardson 1981). FB: Rare. Occasional breeder; for example, one pair nested 16 km south of Franklin Bluffs in 1969 (Sage 1974). CF: Rare and local breeder; for example, a pair nested in Ribdon Valley in the upper Sagavanirktok basin in June 1970 (Sage 1971). Nonbreeders occur in the Lupine and Sagavanirktok valleys and on lakes between Franklin Bluffs and White Hills (Sage 1971, 1974).

Podiceps auritus. Horned Grebe. PB: Three records, of single birds seen near East Dock in Prudhoe Bay on 9 June 1980 (TCR), near PBOC 1–14 June 1987 (DRH et al.), and at Flaxman Island at the eastern edge of the region in July 1930 (Bailey 1948). CF: Rare breeder; for example, a nest with two eggs found between PS 3 and 4 on 7 and 8 July 1981 (JH).

Podiceps grisegena. Red-necked Grebe. PB: One record, of a bird near Wellpad M near MOC 23–25 May 1992 (EEB, KK). CF: One record of a bird in Lupine Valley in the upper Sagavanirktok basin 3 July 1970 (Sage 1974).

Fulmarus glacialis. Northern Fulmar. PB: Uncommon migrant offshore. Near shore, one bird near Oliktok Point, Harrison Bay, 24 August 1983 (TAC).

Puffinus tenuirostris. Short-tailed Shearwater. PB: Bodfish (1936) reported large concentrations in the autumn near shore near Flaxman Island, yet we have only two recent records, of a bird seen in Prudhoe Bay 11 August 1983 (DRS) and a mummified carcass (not preserved) found near Point Storkersen 5 July 1984 (PDM, DRH, CJH, BAC). No fewer than 10 million Short-tailed and Sooty (*P. griseus*) move into the Bering Sea each summer (Sanger and Baird 1977). A very small proportion of the Bering Sea population of *P. tenuirostris* migrates through the Bering Strait into the Beaufort Sea from late July through September, but the species is rarely seen east of Pitt Point (Divoky 1983).

Cygnus columbianus. Tundra Swan. PB: Common breeder. Banding studies indicate that the Prudhoe Bay birds winter in Chesapeake Bay (Sladen 1973). Earliest arrival date at Prudhoe Bay 20 May (AG), although recorded 15–17 May in the Colville River delta by Simpson et al. (1982), Renken et al. (1983), and North et al. (1984). Latest record 27 September 1991 (EEB). FB: Uncommon breeder. CF: Rare visitant. Observed along Dalton Highway when coastal plain is still frozen. In 1980 the species occurred occasionally from late June to early August in Atigun Valley (GE, PK, JK).

Cygnus buccinator. Trumpeter Swan. PB: Two records, of two molting adults seen 0.5 km offshore near the east side of West Dock on 22 July 1981 (DRS) and one adult seen on a freshwater pond 30 September–2 October 1989 (EEB). The only other records for Alaska's north slope come from the Simpson Lagoon, Camden Bay, and Canning River regions, where the species is a rare breeder (Kessel and Gibson 1978).

Anser albifrons. Greater White-fronted Goose. PB: Common breeder, the most common breeding goose in the region. Earliest arrival date (20 birds) 6 May 1991; latest record 1 October 1989 (EEB). FB: Common breeder. CF: Uncommon migrant in spring and fall. Rare local breeder between Franklin Bluffs and White Hills (Sage 1974).

Chen caerulescens. Snow Goose. PB: Locally common on islands in the Sagavanirktok River delta, especially Howe Island, where a substantial colony regularly nests (SJH,RMB). In the spring of 1993, 475 pairs attempted to nest on Howe and Duck islands (SRJ); 408 of these nests successfully fledged young. Approximately 1700 adults and goslings were banded in the Sagavanirktok River delta in late July 1993 (SRJ, CJH). Earliest arrival date (30 birds) 20 May 1990 (EEB). FB: Common migrant; for example, on 27 May 1981, 100 birds were seen near the bluffs (CJH et al.). CF: Common migrant (SRJ).

Chen rossii. Ross' Goose. PB: One record of a pair in the Howe Island Snow Goose colony in summer 1983 and single adult male seen in the same location in late July of the same year. The pair nested, the first confirmed breeding by Ross' Goose in the U.S. (Johnson and Troy 1987).

Chen canagica. Emperor Goose. PB: One record, of a bird in a flock of Brant in the Colville River delta 26 July 1988 (Johnson and Herter 1989).

Branta bernicla. Brant. PB: Common breeder. Earliest spring record 22 May 1989; latest record 9 October 1989 (EEB). FB: Uncommon migrant (spring). CF: We have no records, though Irving (1960) listed it as uncommon migrant.

Branta canadensis. Canada Goose. PB: Fairly common, local breeder. Earliest arrival date 7 May 1972 (AG); latest record 18 September 1989 (EEB). FB and CF: Uncommon migrant (spring and fall). Earliest arrival in CF 13 May 1976 (WCH, KLB).

Anas crecca. Green-winged Teal. PB: Uncommon as a visitant; rare and local as a breeder. For example, one nest (7 eggs) in moist tundra at Prudhoe Bay on 20 June 1980 (WCH). Earliest arrival date 21 May 1991; latest record one female near West Dock 16 September 1991 (EEB). FB and CF: Uncommon and local breeder. Seen as early as 17 May 1980 at TAPS PS 4 (TCR). Three nests found between PS 3 and 4 on 7 and 8 July 1980 (JH); several young on lakes throughout CF in 1970 (Sage 1974). A nest with eggs and adults with young were discovered in Atigun Valley in 1980 (GE, PK, JK, CM, DRS).

Anas formosa.Baikal Teal. PB: One record. One male found 14 June 1993 near Milne Point near the Kuparuk River mouth and stayed into mid-July (TM et al.; photo UAM). The only other record for Alaska's north slope is of one bird at Cape Sabine 28 May 1959 (Maher 1960).

Anas platyrhynchos. Mallard. PB: Uncommon breeder. Earliest arrival date 7 May 1991 (EEB); latest record 16 September 1991 (EEB). FB: Uncommon migrant (spring and fall). CF: Uncommon visitant; for example, pairs were seen on the Sagavanirktok River near its junction with the Lupine River 6 June 1970 and on Galbraith Lake 20 May and 23 June 1970 (Sage 1974). Recorded regularly late May to late August in Atigun Valley (GE, PK, JK, et al.).

Anas acuta. Northern Pintail. PB: Abundant breeder, one of the most abundant ducks on Alaska's north slope. Influxes of nonbreeders, especially males, occur during droughts farther south (Derksen and Eldridge 1980). Bergman et al. (1977) reported that 80% of the Pintails at Point Storkersen were males, apparently nonbreeders. Earliest arrival date 8 May 1981; latest record 1 October 1989 (EEB). FB: Common. Probable breeder. CF: Fairly common. Probable breeder. Earliest arrival date 11 May 1970 (Sage 1974).

Anas discors. Blue-winged Teal. PB: Rare visitant; for example, a pair was at Deadhorse 24–26 June 1981 (DPR, CJH) and a male was near PBOC 3–6 July 1993 (RF, NW, et al.). FB: Rare; for example, a pair 17–25 July 1979 (CJH, SGJ, MAP, AH). CF: Rare; for example, a pair at Galbraith Lake 7 July 1980 (JH) and one bird in Atigun Valley 5 June 1980 (GE, PK, JK, CM, DRS).

Anas clypeata. Northern Shoveler. PB: Uncommon visitant and rare breeder; for example, adults with brood reported 7 August 1971 (AG). Earliest arrival date 16 May 1990; latest record 17 September 1989 (EEB). FB: Uncommon spring migrant. During 1981 numbers were exceptionally high in the region (BJM, RMB), where the species had previously been rare. CF: Rare visitor. Earliest observation of 21 birds between TAPS PS 3 and 4 on 17 May 1980 (TCR). Reported from same area on 7 July 1980 (JH) and near TAPS PS 3 in 1981. Regularly seen in Atigun Valley during June 1980 (GE, PK, JK, CM, DRS).

Anas strepera. Gadwall. PB: Rare visitant. A carcass was found 8 June 1971 (Childs 1972), a male was seen near West Dock 2 June 1984 (DMT, DRH, et al.), three birds were seen in the same location 11 June 1984 (DDG, DW), two pairs were

in Deadhorse 2–3 June 1987, a pair was seen there 1–2 June 1990 (KK, DR, NW), and a male was observed near PBOC 8 June 1991 (RR, NW). CF: One record, of a bird between TAPS PS 3 and 4 in July 1980 (JH).

Anas penelope. Eurasian Wigeon. PB: Two records, of a pair on a small pond near Kuparuk Base Camp near MOC 22 May 1981 (AG) and a male seen near Deadhorse 14 June 1989 (RR).

Anas americana. American Wigeon. PB: Uncommon visitant and rare breeder. Two breeding records from the Colville River delta (West and White 1966, AG). Earliest arrival date 22 May 1973 (AG); latest record 28 September 1989 (EEB). FB: Uncommon migrant. CF: Uncommon migrant, rare and local breeder; for example, two young were seen between TAPS PS 3 and 4 on 7 July 1980 (JH).

Aythya valisineria. Canvasback. PB: Six records, of one male seen near East Dock 6 June 1981, a pair near West Dock 7 June 1981 (AG), a pair near the West Beach State drill site near the Sagavanirktok River delta 7 June 1981 (AG), an adult male near the Kuparuk River 26 June 1989 (CTS, JW), two males near MOC 7–12 June 1990 (RR, KK, et al.), and a pair near Deadhorse 1 June 1992 (EEB et al.). CF: One record, of a female seen between TAPS PS 3 and 4 on 7 July 1980 (JH).

Aythya americana. Redhead. CF: One record of a male between TAPS PS 3 and 4 on 7 July 1980 (JH). There are two other published records for Alaska's north slope, both from Umiat on the Colville River, of a pair 13 June 1953 (Kessel and Cade 1958) and a single male 6 June 1964 (West and White 1966).

Aythya collaris. Ring-necked Duck. CF: Two records, of one male and one probable female at the junction of the Lupine and Sagavanirktok rivers 24 May 1976 (Kessel and Gibson 1978) and a male near TAPS PS 3 on 31 May 1980 (DPR, CJH).

Aythya marila. Greater Scaup. PB: Uncommon, breeding rarely and locally. Earliest arrival date 22 May 1991 (EEB); latest record of one bird 3 October 1993 (EEB). FB: Uncommon. Probable breeder. CF: Common breeder, one of the most common breeding ducks in this region (Sage 1974).

Aythya affinis. Lesser Scaup. PB: Rare visitant. One recorded during four years of study (1981–1984) at Colville River delta (Simpson et al. 1982, Johnson and Herter 1989). A pair at Prudhoe Bay 4 June 1988 (RHD, SMM) and a female at the same location 1 October 1989 (EEB). Up to three males and two females seen near PBOC 27 June–7 July 1993 (RF, NW). Latest record, five birds at West Dock 3 October 1993 (EEB). FB: Rare visitant; for example, a pair on a tundra pond 17 June 1972 (B. Bartels et al.). CF: Rare visitant. Nine separate sightings in Atigun Valley 30 May–2 July 1980 (GE, PK, JK, CM, DRS).

Somateria mollissima. Common Eider. PB: Common breeder on offshore islands and outer coast. Eastward spring migration occurs mostly offshore (Schamel 1974). Flock (1973) recorded a substantial eastward migration at sea in late May 1972. Westward postbreeding migration begins passing offshore islands in early July (Schamel 1978). Aerial surveys and shipboard observations between Barrow and the Sagavanirktok River delta revealed the greatest concentrations of eiders 13–16 km offshore (Bartels 1973). Earliest onshore arrival date 22 May 1973 (AG), latest record 28 October 1991 (EEB).

Somateria spectabilis. King Eider. PB: Common breeder along coast between the Colville and Shaviovik rivers, especially near Oliktok Point (Hall 1975). Farthest inland nesting recorded 14 km south-southwest of Deadhorse during summer 1981 (DPR, CJH). Earliest arrival date 10 May 1990 (dead adult male); latest record 15 October 1989 (EEB). FB: Three records of single birds on 8 and 18 June and 16 July 1981 (RMB, BJM).

Somateria fischeri. Spectacled Eider. PB: Uncommon breeder, restricted primarily to the outer coast. Nesting populations throughout Alaska have fallen 96% since 1971 (USFWS). In June of 1993, the U.S. Fish and Wildlife Service listed the species as threatened. Earliest arrival date 31 May 1972 and 1973 (AG).

Polysticta stelleri. Steller's Eider. PB: Rare. Seen sporadically along the outer coast; for example, near West Dock, one bird on 21 June 1976 (TCR), three pairs on 10 June 1984 (CJH), one pair 23 June 1990 (CJH), and three males and one female 12–14 June 1993 (RF et al.). Probable breeder but no confirmed breeding records.

Histrionicus histrionicus. Harlequin Duck. PB: Three records, of one male and a pair on the Sagavanirktok River near Prudhoe Bay summer 1969 (AG), a male observed off West Dock 5 July 1991 (NW), and two males and one female seen there again 28 June 1992 (RM). CF: Rare; for example, one male near the mouth of the Ribdon River in the upper Sagavanirktok basin 5 June 1970, and another on a lake in same valley 27 June 1970 (Sage 1974). Several reports from Atigun Valley in June 1980 (GE, PK, JK, DRS). Probably a regular local breeder.

Clangula hyemalis. Oldsquaw. PB: Abundant breeder, alternating with the Northern Pintail as the most common duck of the region. By mid- to late July, up to 50,000 molting birds, mostly males, gather on the leeward sides of offshore islands. Females gather to molt in early August, and by late September over 100,000 birds may be staging on Simpson Lagoon (Johnson and Richardson 1980). Earliest spring record 20 May 1991; latest fall record 26 October 1991 (EEB), both at Prudhoe Bay. FB and CF: Common breeder.

Melanitta nigra. Black Scoter. PB: Rare migrant; for example, four flocks totaling 127 birds migrating west off Point McIntyre 30 June 1976 (TCR), and a female found dead at Oliktok Point 14 June 1971 (Hall 1975). CF: One record, of one in Atigun Valley 11 June 1980 (GE, PK, JK, DRS).

Melanitta perspicillata. Surf Scoter. PB: Uncommon migrant, occuring primarily offshore and on outer coast. Most onshore sightings are from the Point Storkersen area. Schamel (1978) saw a group of 200–300 in Harrison Bay near Oliktok Point in August 1971. Earliest arrival date 7 June 1971 (Bergman et al. 1977). CF: Rare migrant; for example, reported from a single lake during late July and early August 1969 (Sage 1974), and one was seen in Atigun Valley 13 June 1980 (GE, PK, JK, CM, DRS).

Melanitta fusca. White-winged Scoter. PB: Uncommon, breeding rarely on offshore islands. Earliest record 1 June 1984 at Colville River delta (North et al. 1984). FB: Rare migrant and possible breeder. CF: Rare breeder; for example, female with eight young near Sagwon in mid-August 1974 (JC, UAM) and female with four young 14 km south of TAPS PS 3 on 9 August 1977 (WDS, JPM).

Bucephala clangula. Common Goldeneye. PB: Three records, of one bird at Prudhoe Bay drill site 2 June 1980 (AG), a female near MOC 29 September 1989 (EEB), and a female near PBOC 11 June 1991 (JL et al.). CF: One record, of a female between TAPS PS 3 and 4 in July 1980 (JH). The only other records for Alaska's north slope are from the Colville River, where Kessel and Cade (1958) listed the species as accidental.

Bucephala islandica. Barrow's Goldeneye. PB: One record, of a female observed near Prudhoe Bay on 10 July 1991 (RF, NW).

Bucephala albeola. Bufflehead. PB: Two records, of one bird near Deadhorse 16 July 1989 (CTS) and a female near PBOC 30 June 1992 (JL). CF: Two records, of a female observed between TAPS PS 3 and 4 in July 1980 (JH) and another individual in Atigun Valley 8 June 1980 (GE, PK, JK, DRS).

Mergus serrator. Red-breasted Merganser. PB: Rare migrant. Earliest record of one pair on the Kuparuk River 31 May 1973 (AG); latest record of two birds at Prudhoe Bay 30 September 1991 (EEB). FB: Rare breeder. Sage (1974) reported broods just north of the bluffs. CF: Rare breeder; for example, Sage (1974) reported broods in Atigun Valley and near Galbraith Lake.

Haliaeetus leucocephalus. Bald Eagle. PB: One record, of one immature seen near Prudhoe Bay 10 June 1993 (KTK). CF: One record, of an adult reported at the east end of Atigun Valley 8 May 1970 (Sage 1974).

Circus cyaneus. Northern Harrier. PB: Rare migrant. FB: Uncommon migrant. CF: Uncommon migrant, probable breeder. Territorial pairs seen at the confluence of the Sagavanirktok and Lupine rivers 31 July 1975 and 22 July 1977 (Kessel and Gibson 1978). Several sightings of adults and juveniles in Atigun Valley during June and July, 1977–1981 (DRS, GE, PK, JK).

Accipiter striatus. Sharp-shinned Hawk. PB: One record, of a first-year female (UAM 3831) found at Prudhoe Bay 21 May 1980 (MA). CF: One record, of a bird sighted in Atigun Valley 17 August 1980 (GE, PK, JK).

Buteo lagopus. Rough-legged Hawk. PB: Uncommon visitant. Postbreeding birds wander to the coast during summer and early fall. FB: Uncommon breeder; for example, a recently abandoned nest on tundra along the Sagavanirktok River 60 km south of the Arctic Ocean 17 August 1985 (Ritchie 1991). CF: Uncommon breeder; for example, nest and two fledglings at Happy Valley, 30 July 1981 (Ritchie 1991). Earliest arrival date 15 May 1976 (WCH, KLB).

Aquila chrysaetos. Golden Eagle. PB: Rare summer and early fall visitant. FB: Uncommon visitant. CF: Uncommon but widespread breeder. Several sightings in Atigun Valley during June and July, 1977–1981 (DRS).

Falco sparverius. American Kestrel. PB: Three records. Several sightings of presumably one bird in Prudhoe Bay environs July–September 1981 (DRS), one male seen near the Kuparuk River 11 June 1992 (CJH, MB, et al.), and a female seen near West Dock on 15 June 1992 (JD). CF: One record, of a bird seen in Atigun Valley on 13 and 15 August 1980 (GE, PK, JK).

Falco columbarius. Merlin. PB: Six records, of one bird in the Prudhoe Bay area 28 May 1973, one seen near the Kuparuk River 6 June 1991 (DR), another there 14 June 1992 (CJH, KC, JL), a female seen there 29 June 1991 (RF), one at Endicott 27 May 1993 (SRJ), and another near Prudhoe Bay 24 August 1993 (RF). FB: One record, of a bird near Franklin Bluffs in July 1978. CF: Two records, of birds sighted in foothills near Toolik Lake 16 June and 2–3 August 1980.

Falco peregrinus. Peregrine Falcon. PB: Uncommon migrant and visitant. Most records are during spring and fall along outer coast, probably of migrants and postbreeding wanderers. Earliest arrival date 12 May 1991 (EEB). FB and CF: Uncommon breeder.

Falco rusticolus. Gyrfalcon. PB: Uncommon visitant. Occasional postbreeding wanderers noted in summer and fall along coast. FB: Uncommon visitant from nearby nesting sites. CF: Uncommon breeder; for example, nest with three nearly fledged young in above-ground portion of the trans-Alaska pipeline 150 km south of Prudhoe Bay 15 July 1988 (Ritchie 1991).

Lagopus lagopus. Willow Ptarmigan. PB: Fairly common breeder. Less common in coastal areas than inland. Earliest record 2 March 1989 (EEB), but, according to oil-field personnel, some birds remain throughout the winter (Sage 1974). FB and CF: Common breeder. Large flocks in spring (150 birds) and fall (400 birds) (Sage 1974).

Lagopus mutus. Rock Ptarmigan. PB: Common breeder. More common along coast than inland (Irving 1960, Sage 1974, DMT). FB and CF: Fairly common breeder.

Fulica americana. American Coot. PB: One record, of a carcass found in the Colville River delta 10 June 1970 (Kessel and Gibson 1978).

Grus canadensis. Sandhill Crane. PB: Uncommon migrant and visitant. One breeding record, for the spring of 1971, 30 miles north of Umiat on the east side of the Colville River (AG). Earliest arrival date 10 May 1971 (AG). Examples of other records: one pair at Prudhoe Bay study site 26 June 1973 (WCH), one adult at Point Storkersen 26 July 1977, a single juvenile at the same location 2 June 1980 (TCR), and single adults seen on Endicott Causeway 24 May 1991 and 23 May 1992 (EEB). FB and CF: Rare visitant; for example, a single adult seen at Sagwon Bluffs 2 May 1973 (TCR).

Pluvialis squatarola. Black-bellied Plover. PB: Uncommon breeder. Earliest arrival date 15 May 1990 (EEB); latest record 2 October 1989 (EEB). FB: Uncommon breeder. CF: Uncommon probable breeder (Sage 1974).

Pluvialis dominica. American Golden-Plover. PB: Common breeder. Earliest arrival date 20 May 1991 (EEB). Nesting densities are lower along coast than farther inland (McCaffery et al. 1982). During fall migration (mid-July to August), it is not uncommon to see flocks ranging from 10 to 50 birds flying east along the coast (CJH, DPR). On 18 August 1978, 132 birds were seen flying east from Point Storkersen (DBM, UAM). Latest record 11 September 1989 (EEB). FB: Common breeder. Earliest arrival date 16 May 1976 (WCH). CF: Common breeder.

Charadrius semipalmatus. Semipalmated Plover. PB: Uncommon breeder, nesting along several rivers. Earliest arrival date 20 May 1972 (AG). FB and CF: Uncommon breeder. Sage (1974) found Semipalmated Plovers to be rare in the CF, observing them on only two occasions in 1970, but DRS saw them often near Toolik Lake. Confirmed breeding records for the region come from Atigun Valley, where Rothe (1979) found five nests on floodplain gravel on the upper river 26–28 June 1979. Flightless young and adults were seen at same location during summer 1980 (GE, PK, JK).

Charadrius vociferus. Killdeer. PB: Four records, of one bird reported from Colville River delta 19 June 1975 (Kessel and Gibson 1978), one seen at Oliktok Point 12 June 1977 (Johnson and Richardson 1980), one at Prudhoe Bay 9 June 1984 (DMT), and one near West Dock 10–11 June 1993 (KTK).

Charadrius morinellus. Eurasian Dotterel. PB: Two records, both for near Point Storkersen, of pairs 10 June 1983 (BAC, DMT) and 10 June 1992 (RF).

Tringa flavipes. Lesser Yellowlegs. PB: Rare visitant; for example, single birds noted at Point Storkersen 6 June 1973 (Bergman 1974) and at Prudhoe Bay 27 July 1979 and 8 June 1980 (TCR). FB: Rare visitant. CF: Uncommon visitant. Sage (1974) reported the Lesser Yellowlegs once, about 48 km south of Franklin Bluffs on 26 July 1969. DPR and CJH recorded seven between TAPS PS 3 and 4 on 7 July 1980, while GE, PK, JK, and DRS saw the species frequently in Atigun Valley from late May to early August 1980.

Heteroscelus incanus. Wandering Tattler. PB: One record, of a single bird in the Colville River delta on 6 June 1975 (Kessel and Gibson 1978). CF: Uncommon probable breeder; for example, single birds seen near the end of Atigun Valley 2 July 1970 (Sage 1974) and in upper Atigun Valley 30 May 1981 (DPR, CJH, DRS). Tattlers were observed regularly in Atigun Valley 26–28 June 1979 (Rothe 1979) and from 10 June to late July 1980 (GE, PK, JK, DRS).

Actitis macularia. Spotted Sandpiper. CF: Uncommon breeder; for example, a pair seen displaying in Atigun Valley 23 June 1970 (Sage 1974), one bird observed between TAPS PS 3 and 4 on 10 July 1980 (JH), and adults with flightless young observed in Atigun Valley during spring 1980 (GE, PK, JK, CM, DRS). Kessel and Cade (1958) reported this species to be fairly common in the Colville River valley.

Bartramia longicauda. Upland Sandpiper. PB: One record, of a bird seen near West Dock 4 June 1978 (CJH, PGC). CF: Two records, of one heard calling near TAPS PS 4 on 7 July 1980 (JH) and one seen in Atigun Valley on 2 June 1980 (GE, PK, JK). Reported breeding on upper Canning River (Kessel and Gibson 1978).

Numenius phaeopus. Whimbrel. PB: Uncommon visitant and migrant. Sporadic sightings throughout summer, apparently of postbreeding birds arriving from inland nesting sites, are the norm. FB: Uncommon breeder. Earliest arrival date 25 May 1979 (CJH). CF: Uncommon breeder. Earliest arrival date 26 May 1976 (WCH).

Limosa limosa. Black-tailed Godwit. PB : One record, of one bird seen along lake shore near PBOC on 24 July 1993 (RF). This is the first record for Alaska's north slope, though the species is casual in western Alaska.

Limosa haemastica. Hudsonian Godwit. PB: Six records, four for Prudhoe Bay, of one on 6 August 1977 (WDS, JPM), one on 6 and 8 June 1978 (CJH), one on 31 May 1979 (CJH), and two on 8 August 1979 (CJH, AG). In 1986 near the Colville River, three birds were reported 6 and 18 August (Garner and Reynolds 1986). One juvenile was seen near West Dock 4 August 1993 (RF).

Limosa lapponica. Bar-tailed Godwit. PB: Rare visitant, primarily in spring and fall; for example, one bird was at the Prudhoe Bay study site 9 June 1972 (WCH), one was at Point Storkersen 16 June 1977 (TCR), and another was at PBOC on 2 September 1990 (EEB). We have no evidence of breeding although in spring 1981 two pairs displayed and defended territories 13 km south of Prudhoe Bay (CJH, DPR). FB: Uncommon breeder. Earliest arrival date 26 May 1979 (CJH). CF: Uncommon probable breeder; for example, single birds seen at Galbraith Lake 20 May 1970 (Sage 1974) and in Atigun Valley 31 May 1980 (GE, PK, JK).

Arenaria interpres. Ruddy Turnstone. PB: Fairly common breeder and migrant, restricted primarily to the outer coast, including offshore islands. For example, a pair had a nest with two eggs at the Prudhoe Bay study site on 7 June 1975 (WCH, KLB). Earliest arrival date 19 May 1979 (AG); latest date 16 September 1991 (EEB). FB and CF: Rare spring migrant; for example, a pair was at Toolik Lake during late May 1978 (DRS) and a single bird was in Atigun Valley 30 May and 3 June 1980 (DPR, WCH, CJH, GE, PK, JK).

Arenaria melanocephala. Black Turnstone. PB: Three records, of single birds seen in the Colville River delta 29–31 May 1979 (JWH), at the mouth of the Kuparuk River 3 June 1980 (RHM, GEK), and at Point Gordon just west of the Canning River delta 9 June 1980 (SRJ). FB: One record of a bird near Franklin Bluffs 9 June 1980 (DGR). This species is very rare north of the Brooks Range.

Aphriza virgata. Surfbird. PB: One record, the first for Alaska's north slope, of a bird seen on the MOC gravel pad on 20 August 1981 (EEB).

Calidris canutus. Red Knot. PB: Rare visitant and migrant; for example, two juveniles were seen on the beach east of Point Storkersen 16 August 1977 (WDS, JPM), one bird was seen at Point Storkersen 21 June 1978 (DBM, UAM), and one was seen near West Dock during mid-June 1982 (DPR). The Red Knot is a rare migrant on the Chukchi Sea coast and was unknown east of Barrow until recently (Pitelka 1974). It is a rare breeder on Cooper Island and at Barrow (Bailey 1948, Pitelka 1974).

Calidris alba. Sanderling. PB: Uncommon migrant. Two summer records, of a pair actively displaying at the study site 13 km south of Prudhoe Bay 1–8 June 1981 (CJH, DPR), and one bird observed near Oliktok Point 8 July 1993 (PDM, JB, USFWS). Latest record 16 September 1991 (EEB). FB: One record, of one bird along the Sagavanirktok River 28 July 1969 (Sage 1974). The Sanderling's nearest breeding sites (irregular) are at Barrow to the west (Pitelka 1974) and in the Arctic National Wildlife Refuge to the east (Garner and Reynolds 1986).

Calidris pusilla. Semipalmated Sandpiper. PB: Abundant breeder, the most numerous shorebird in the region. Earliest arrival date 10 May (AG); latest record 25 August 1991 (EEB). Peak migration of juveniles along coast is about 29–30 July each year (Connors and Risebrough 1978). FB: Fairly common breeder. CF: Uncommon breeder. Not recorded by Sage (1974) but observed regularly along Dalton Highway (CJH, DPR, WCH, RMB, BJM) and at Toolik Lake in May and June 1981 (DRS).

Calidris mauri. Western Sandpiper. PB: Uncommon migrant; one record of breeding. A nest found 21 June 1992 on the outer coast near Point Storkerson constitutes the first breeding record east of the Meade River (NW). FB: Rare migrant. CF: One record, of a pair in Atigun Valley 20 June 1970 (Sage 1974).

Calidris ruficollis. Rufous-necked Stint. PB: Ten records. This species is now being recorded nearly annually. One bird on 9 June 1969, a pair on 12 June 1975 (JWH), and a pair on 2 June 1977 (Johnson and Richardson 1980) were all in the Colville River delta. A single bird was near Point Storkersen 28 June 1990 (RF, JL, et al.). On the west side of Prudhoe Bay, one was seen 20 June 1991 (NW, RF), a second was seen 20 July 1991 (RF), and in 1992 there were four separate sightings of up to three individuals from 6 to 22 June (RF, JL, et al.). One bird was found near West Dock 14 June 1993 (KK, DPR). The species' nearest breeding locality is Barrow (Pitelka 1974).

Calidris minuta. Little Stint. PB: One record, the third for Alaska's north slope, of a bird on the west side of Prudhoe Bay 19 June 1991 (RF, NW, DMT, et al.).

Calidris minutilla. Least Sandpiper. PB: Rare migrant and visitant. FB: Rare visitant; for example, two juveniles seen at study site 8 August 1979 (CJH, SGJ, MAP, AH). CF: Uncommon breeder. Sage (1974) reported at least nine pairs from a census of 10 km^2 in the Ribdon Valley in the upper Sagavanirktok basin, with one nest with eggs on 29 June 1970. Rothe (1979) reported one bird in Atigun Valley on 27 June 1979. GE, JK, PK, CM, and DRS discovered a nest with eggs in Atigun Valley during spring 1980. BJM and RMB found several nests at Sagwon Bluffs during spring 1981 and subsequently confirmed regular nesting of small numbers at that location.

Calidris fuscicollis. White-rumped Sandpiper. PB: Rare, breeding irregularly and at variable densities (SGJ, DMT). The Prudhoe Bay region appears to be at the western end of the White-rumped Sandpiper's normal breeding range, though the species has nested as far west as Barrow.

Calidris bairdii. Baird's Sandpiper. PB: Fairly common breeder, mainly along the outer coast and in the Sagavanirktok River delta (DMT, Johnson and Herter 1989). In 1980, Baird's Sandpiper was one of the commonest breeding shorebirds at Point Storkersen (DRS). Earliest arrival date 28 May 1982 at Colville River delta (Simpson et al. 1982). FB and CF: Uncommon breeder.

Calidris melanotos. Pectoral Sandpiper. PB: Common to abundant breeder. One of the most widespread and conspicuous birds of the region. Earliest arrival date 21 May 1991 (EEB). Most adult males depart the region by the first week of July; latest record 13 September 1991 (EEB). FB: Fairly common breeder. CF: Uncommon migrant. Pairs have been observed but we have no nesting records.

Calidris acuminata. Sharp-tailed Sandpiper. PB: Two records, of one immature in the Colville River delta 7 August 1982 (Simpson et al. 1982) and another immature photographed near MOC on 11 September 1991 (EEB; photo UAM).

Calidris alpina. Dunlin. PB: Common breeder. Found primarily along the coast, although the species nests at least 13 km inland south of Prudhoe Bay. Earliest arrival date 24 May 1979 (TCR); latest record 23 September 1993 (EEB). FB: One record, of a bird seen near study site 12 July 1981 (BJM, RMB).

Calidris ferruginea. Curlew Sandpiper. PB: Three records, of three juveniles seen near Oliktok Point 8–9 August 1972 (Kessel and Gibson 1978), one at Deadhorse 5 June 1984 (KDR), and one adult at Endicott 3 June 1993 (SRJ). The Curlew Sandpiper is a very rare breeder at Barrow (Pitelka 1974, Kessel and Gibson 1978).

Calidris himantopus. Stilt Sandpiper. PB: Fairly common and very conspicuous breeder. Earliest arrival date 24 May 1991 (EEB). FB: Fairly common breeder. About 100 juveniles in one group on 29 July 1979 (CJH). CF: Rare visitant in spring and fall.

Tryngites subruficollis. Buff-breasted Sandpiper. PB: Fairly common breeder. Nesting densities vary widely from year to year; in 1978 Buff-breasted Sandpipers were common and widespread, but subsequently their numbers have varied greatly. Earliest arrival date 23 May 1985 (EEB). Males emigrate about the first week of July; flocks of fall migrants have been noted in the Canning River delta during early August (Martin and Moitoret 1981). FB: Fairly common breeder. CF: Rare migrant and visitant; for example, Sage (1974) saw one bird near the confluence of the Sagavanirktok and Lupine rivers on 9 June 1970. Pamplin (1979) recorded this species in Atigun Valley in spring 1979.

Philomachus pugnax. Ruff. PB: Eleven records. This species is now being recorded almost annually. A male near Prudhoe Bay study site 18–28 June 1978 was presumably the same seen there again 20–21 June 1979. A different male at the same location 14–21 June 1980 chased female Pectoral Sandpipers and was repeatedly chased by other shorebirds (WCH, CJH, DPR, SGJ, TCR; photo UAM). One male in breeding plumage was seen near Kuparuk River 5 July 1982 (DMT), a single male was near the Prudhoe Bay study site 11 June 1984 (WDM), a juvenile male was near Sagavanirktok River delta 13–15 August 1989 (CTS, KK, RF), a male was near Endicott 29 June 1991 (JY), a male was near Point Storkerson 12 June 1992 (JL, RF), and two males were near PBOC 24 June 1992 (NW et al.). To the west of the region, one bird was seen in the Colville River delta 17 August 1978 (JWH).

Limnodromus scolopaceus. Long-billed Dowitcher. PB: Uncommon breeder. Earliest arrival date 25 May 1979 (CJH); latest record 3 September 1989 (EEB). Large numbers of juveniles appear in early August and reach peak numbers by the third week of August, as they move east (Connors and Risebrough 1979, Johnson and Herter 1989, DMT). FB and CF: Uncommon breeder.

Gallinago gallinago. Common Snipe. PB: Uncommon migrant (probable breeder); for example, single birds were noted 30 May 1979, 13 June 1980 (TCR), and 17 June 1991 (EEB). Each spring, snipes display in the region, but no nests have been found. FB and CF: Uncommon migrant (probable breeder).

Phalaropus lobatus. Red-necked Phalarope. PB: Common breeder (Figure 5). Earliest arrival date 20 May 1991 (EEB); latest record 3 October 1993 (EEB). Large flocks of females congregate on tundra ponds and along the coast in late June. By late July and early August, males begin migration staging, and juveniles reach peak numbers in mid-August along the outer coast. FB: Common breeder. CF: Fairly common breeder.

Figure 5. Male Red-necked Phalarope (*Phalaropus lobatus*) brooding young at a nest on the wet coastal plain.

Photo by Craig Hohenberger

Figure 6. Male Red Phalarope (*Phalaropus fulicaria*) brooding young at a nest on the wet coastal plain.

Photo by Craig Hohenberger

Phalaropus fulicaria. Red Phalarope. PB: Common breeder (Figure 6). Status similar to that of *P. lobatus* except during fall, when migrating flocks of *P. lobatus* greatly outnumber *P. fulicaria* along the outer coast. The Red Phalarope is rare, mainly a visitant, inland. Earliest arrival date 29 May 1982 in the Colville River delta (Simpson et al. 1982); latest record 9 October 1991 at West Dock (EEB). FB and CF: Rare visitant.

Stercorarius pomarinus. Pomarine Jaeger. PB: Common spring migrant (onshore); common fall migrant (offshore) during August, decreasing by early September (Divoky 1983). Earliest record 20 May 1991 (EEB). The Pomarine Jaeger's distribution varies unpredictably from year to year because of the species' dependence on small mammals for prey (Pitelka et al. 1955a,b, Maher 1974, Johnson and Herter 1989). It is rare onshore after the third week of June though recorded as late as 17 August in 1991 (RF). FB: Common spring migrant. CF: Uncommon spring migrant.

Stercorarius parasiticus. Parasitic Jaeger. PB: Common breeder. Earliest spring record 24 May 1974 (WCH); latest fall sighting 27 September 1991 (EEB). FB and CF: Common breeder.

Stercorarius longicaudus. Long-tailed Jaeger. PB: Fairly common but scattered; probably breeds at southern edge of coastal plain. No confirmed nesting records from this region. Earliest arrival date 25 May 1979 (CJH). Long-tailed Jaegers constituted 10% of all birds seen offshore from 3 to 15 August 1969 (Frame 1973). FB and CF: Fairly common breeder.

Larus philadelphia. Bonaparte's Gull. PB: Four records, of adults in breeding plumage near Prudhoe Bay on 6 June 1970 (SOM, UAM), 9 June 1976 (AG), 31 May 1991 (NW), and 1–3 June 1992 (NW). CF: One record, of a bird sighted in Atigun Valley 5 June 1980 (GE, PK, JK, DRS).

Larus canus. Mew Gull. PB: Rare migrant and visitant; for example, one bird at Prudhoe Bay study site 13 June 1975 (KLB), two individuals near Oliktok Point 13 July 1977 (Johnson and Richardson 1980), one adult near MOC on 11 May 1990 (EEB), and an adult near PBOC 11 June 1992 (CJH, DR, JL, RF). CF: Uncommon breeder. Sage (1974) found it scarce in his study area, but DRS found several, including nests, from May to August in 1977, 1978, and 1979. JH found a few nests and saw many birds between TAPS PS 3 and 4 during 1980, while GE, PK, JK, and DRS confirmed nesting in Atigun Valley the same year.

Larus californicus. California Gull. PB: One record, of an adult carefully studied near Deadhorse after strong southern storm on 7 July 1981 (DPR, BJM, RMB, CJH).

Larus argentatus. Herring Gull. PB: Uncommon migrant and visitant, being fairly common in September during some years (LGL). The nearest breeding record is from the Colville River in 1964 (West and White 1966). Latest fall record 27 September 1990 (EEB). Divoky (1983) reported large gulls with dark wing-tips on 3% of all pelagic surveys. FB: Rare visitant.

Larus thayeri. Thayer's Gull. PB: Uncommon to rare pelagic and nearshore migrant (Divoky 1983, Johnson and Herter 1989). Johnson and Richardson (1980) reported flocks of *L. thayeri* and/or *argentatus* in Prudhoe Bay and Simpson Lagoon. Latest record 23 September 1993 (EEB).

Larus schistisagus. Slaty-backed Gull. PB: Rare visitant; for example, subadults were in Prudhoe Bay 31 July 1977 (WDS, JPM) and 26–27 June 1990 (KK, NW), and another was 13 km south of there 15 June 1981 (CJH, DPR). One third-year bird was near West Dock 13–16 June 1993 (RF), and an adult was there 17 June 1993 (RF, KTK). One was recorded in the Colville River delta August 1977 (Kessel

and Gibson 1978). At West Dock, an individual was seen from 8 July to 18 August 1991 (DWi, NW, RF) and two birds were observed on 11 June 1992 (JL, RF). FB: One record, of a bird flying north along Dalton Highway 20 June 1981 (DPR, CJH).

Larus glaucescens. Glaucous-winged Gull. PB: One record, of a bird at Deadhorse 28–30 July 1977 (WDS, JPM). FB: One record, of a bird at the study site 20 June 1981 (BJM, RMB).

Larus hyperboreus. Glaucous Gull. PB: Common breeder. One of the most abundant seabirds in pelagic and nearshore areas of Beaufort Sea in summer (Divoky 1983, 1984). Breeds commonly on offshore islands and on islands in tundra lakes and ponds. Earliest arrival date 30 April 1992 (EB); noted in late November 1975 (GM, UAM). FB and CF: Uncommon breeder.

Rissa tridactyla. Black-legged Kittiwake. PB: Common visitant offshore, rare onshore. Most kittiwakes recorded during pelagic surveys of the Beaufort Sea (Frame 1973, Watson and Divoky 1974a,b, Divoky 1983, Johnson and Herter 1989) were subadult or nonbreeding, although Divoky (1983) reported that about half were adults. The species is more common in the western Beaufort Sea than farther east. Small numbers were in the Beaufort Sea of central Alaska (Simpson Lagoon to Barter Island) 18 September–7 October 1985 (LGL).

Rhodostethia rosea. Ross' Gull. PB: Rare visitant in our study area but a common fall migrant in the far western Beaufort Sea between Cape Halkett and Point Barrow (GJD). One immature female was at the Prudhoe Bay study site 9 August 1975 (KLB), and another bird was near the same area 25 August 1975 (AG). Two birds were in the Colville River delta 21–22 June 1978 and again 8 May 1981 (JWH); one bird was there 15 June 1982 (LGL). A group of 21 adults and 8 immatures was at West Dock 29 and 30 September 1990 (EEB). An immature was in Prudhoe Bay 25 July 1991 (RF), and a breeding-plumaged bird was near the Kuparuk River 15 June 1992 (CJH, KTK).

Xema sabini. Sabine's Gull. PB: Uncommon breeder on barrier islands and locally along the coast but makes little use of nearshore or pelagic zones of the Beaufort Sea during the nesting season (Divoky 1983, Johnson and Herter 1989). Sabine's Gulls move to the open sea in August and are most common in the Beaufort Sea east of Barrow. Frame (1973) reported the species to be the second most common migrant offshore. Its westward migration is most pronounced during late August and early September. Latest date 28 October 1991 (DT). FB: Two records, of one bird at the north end of the bluffs 31 July 1969 and a flock of seven there 9 June 1970 (Sage 1974).

Pagophila eburnea. Ivory Gull. PB: Uncommon migrant offshore. Frame (1973) encountered two birds about 86 km northeast of Oliktok Point 14 August 1969. Watson and Divoky (1972) and Divoky (1976) considered the Ivory Gull an uncommon pelagic migrant in the Beaufort Sea and an uncommon summer visitant associated with leads in pack ice in the Chukchi and Beaufort seas. There is little evidence of concentrated migration by this species in Beaufort Sea area (GJD. Johnson and Herter 1989). One record from Colville River delta (Anderson 1913).

Sterna paradisaea. Arctic Tern. PB: Fairly common breeder. Earliest arrival date 31 May 1982 in the Colville River delta (Simpson et al. 1982). FB: Uncommon (probable breeder). CF: Uncommon breeder. Widely distributed along the Sagavanirktok River and its tributaries, where it nests on gravel bars (Sage 1974). Nesting pairs recorded in Atigun Valley in spring 1980 (GE, PK, JK, DRS).

Uria lomvia. Thick-billed Murre. PB: Four records of single birds, three near Point Storkersen, 20 July 1971 (Bergman et al. 1977), 18 July 1976 (TCR). and 20 May–

12 August 1972 (Schamel 1978), and one from Milne Point near the Kuparuk River mouth, 17 August 1978 (Johnson and Richardson 1980).

Cepphus grylle. Black Guillemot. PB: Uncommon migrant and breeder. Observed offshore (Egg Island) 20 May–early August 1972 (Schamel 1978). Since 1978 Black Guillemots have nested annually on barges in Prudhoe Bay, with up to 50 on barges along West and East docks (AG, DRS, et al.). At the eastern edge of the region, two birds were at Flaxman Island 6 August 1972 (Divoky et al. 1974). The species is an uncommon local breeder in burrows and beach flotsam along the Chukchi and Beaufort Sea coasts from the Seahorse Islands and Barrow east to Igalik Island (MacLean and Verbeek 1968, Divoky et al. 1974, Kessel and Gibson 1978, Divoky 1984).

Aethia pusilla. Least Auklet. PB: Three records, of one bird near Atigaru Point just west of the Colville River delta in summer 1988 (RR), a pair near Point Brower 9 September 1988 (Johnson and Herter 1989), and two birds near Point Brower 7–14 September 1989 (RR).

Fratercula cirrhata. Tufted Puffin. PB: Two records, of one bird at Point Storkersen 12 August 1972 (Bergman et al. 1977) and one bird near West Dock 12 August 1981 (KP). The species is accidental along the Chukchi and Beaufort Sea coasts (Pitelka 1974, Johnson and Herter 1989).

Fratercula corniculata. Horned Puffin. PB: Two records from barges offshore Prudhoe Bay, of a pair on 15 August 1981 (DRS) and one bird on 22 August 1981 (DMT). West of the region, Divoky (1982) found a few pairs occupying Black Guillemot nests and incubating their eggs on Cooper Island (east of Barrow). From 1986 to 1988 several pairs attempted to nest in boxes installed there for Black Guillemots, and one pair fledged one young in 1986 (Johnson and Herter 1989).

Nyctea scandiaca. Snowy Owl. PB: Highly cyclic breeder, closely correlated with lemming populations; fairly common in some years. Nested in region in 1969 (AG), 1972 (WCH), 1988, 1989, and 1992 (Figure 7). Earliest arrival date 5 May 1971 (AG). Seen annually but only a few birds present some years. FB: Uncommon occasional breeder; for example, four birds south of bluffs 17 September 1969 (Sage 1974). CF: Uncommon occasional breeder (Sage 1974).

Surnia ulula. Northern Hawk-Owl. PB: Two records, of one bird in the Colville River delta 8 May 1981 (JWH) and another photographed at Endicott Island on 21 August 1991 (DT; photo UAM).

Strix nebulosa. Great Gray Owl. PB: One record, of a bird at Prudhoe Bay 29 May 1989 (PS, EF). This species is very rare north of the Brooks Range.

Asio flammeus. Short-eared Owl. PB: Rare visitant. Earliest arrival date 5 May 1989 (EEB); latest record of a loose flock of seven birds 11 September 1990 (EEB). FB and CF: Uncommon visitant (probable breeder).

Chordeiles minor. Common Nighthawk. PB: Two records, of one female hawking insects near Point Storkersen 4 and 6 July 1984 (CJH, DPR, REH, PM, BAC) and one bird at Prudhoe Bay 17–21 June 1990 (JW, KK).

Ceryle alcyon. Belted Kingfisher. FB: Only record is of feathers found in a Peregrine Falcon eyrie on the bluffs during early July 1974 (CMW, Sage 1974). CF: One record, of a bird observed in Atigun Valley 23 August 1980 (GE, PK, JK).

Colaptes auratus. Northern Flicker. PB: One record, of a carcass found at a fox den 1 June 1979 (HF, PSG). CF: One record, of a bird at the eastern end of Atigun Valley 21 May 1970 (Sage 1974). Kessel and Cade (1958) recorded this species along the Colville River in 1937.

Contopus sordidulus. Western Wood-Pewee. PB: One record, of an individual calling near Oliktok Point on 1 July 1993 (PDM, JB, USFWS). This constitutes only the fourth record for Alaska's north slope.

Sayornis saya. Say's Phoebe. PB: One record, of a dead bird found in a building at Point Storkersen 19 July 1978 (DBM). CF: Uncommon local breeder. Sage (1974) found Say's Phoebes nesting in Atigun Canyon on 23 June 1970. Kessel and Gibson (1978) reported evidence of its nesting at Sagwon Bluffs. Cade and White (1973) found it nesting as far north as 69°05' N on the Lupine River in the upper Sagavanirktok basin during summer 1970.

Tyrannus tyrannus. Eastern Kingbird. PB: Three records, of one bird near Deadhorse 31 July–3 August 1970 (AG), one bird at the mouth of the Colville River 1 July–3 August 1975, and one at same location 27–28 June 1978 (JWH). FB: One record, of a bird at the bluffs 22 July 1976 (Kessel and Gibson 1978).

Eremophila alpestris. Horned Lark. PB: Rare breeder; for example, nest and fledglings in 1989 in the Sagavanirktok River delta (RMB). Single birds were seen at Point Storkersen 6 June 1973 (Bergman et al. 1977) and 25 July 1977 (TCR), at West Dock 20 June 1978 (CJH), and near MOC 2 July 1991 (EEB). FB: Rare visitant; for example, single birds were at the study site 24 June and 30 June 1981 (BJM, RMB). CF: Uncommon but widespread; probably breeds (Sage 1974, GE, PK, JK, CM, DRS).

Progne subis. Purple Martin. PB: The single record, of a female near Deadhorse 12 June 1986 (DMT), is the only record for Alaska's north slope.

Figure 7. Female Snowy Owl (*Nyctea scandiaca*) at a nest in tundra of the wet coastal plain.

Photo by Craig Hohenberger

Tachycineta bicolor. Tree Swallow. PB: Three records, of two birds at Point Storkersen 21 June 1976 (TCR), one bird near Deadhorse 7 June 1984 (DMT), and one at Prudhoe Bay 20 June 1991 (KK). FB: Two records, of a juvenile at study site M12 on 7 August 1979 (CJH, SGJ, MAP, AH) and an adult at the same location on 10 June 1981 (BJM, RMB). CF: One record, of several birds seen perched on antenna at Toolik Lake camp in late May and June 1979 (DRS).

Riparia riparia. Bank Swallow. PB: Seven records, of one along the Canning River during spring 1970 (AG), one near the Kuparuk River 30 May 1971 (AG), single birds at Point Storkersen 9 June 1972 and 5 June 1975 (Bergman et al. 1977), one 13 km south of Prudhoe Bay 6 June 1981 (DPR, CJH), one at Prudhoe Bay 21 June 1990 (KK), and one near Prudhoe Bay 2 June 1993 (KTK et al.). FB: One record, of a bird at the study site 29 June 1981 (BJM, RMB). CF: One breeding record, the only one for Alaska's north slope. A colony of 8–10 birds was discovered on 4 July 1989 nesting near Sagwon Bluffs along the Sagavanirktok River (CTS, TAC), where none had nested from 1986 to 1988.

Hirundo pyrrhonota. Cliff Swallow. PB: Seven records, of single birds at Point Storkersen 7 June 1971 and 7 June 1975 (Bergman et al. 1977), near Deadhorse in early June 1978 (SGJ), near West Dock 12 June 1984 (DPR, DMT, PDM, REH), 8 miles east of Prudhoe Bay 9 June 1993 (MI), and in the Colville River delta 27 May 1964 and 4 May 1975 (JWH; photos UAM). CF: Rare breeder, known from two sites. Irving (1960) reported that during the winter of 1908 or 1909 Simon Paneak of Anaktuvuk Pass found frozen young birds in over 100 nests built against cliffs near the end of the west fork of the Kuparuk River at 68°35' N, 149°20' W. Sage (1973, 1974) located a colony of 7–10 pairs on a tributary of the Atigun River on 24 June 1970.

Hirundo rustica. Barn Swallow. PB: Ten records. Single birds were reported at Oliktok Point 15 June 1971 (Hall 1975), at Point Storkersen 14 and 20 June 1978 (DBM; photos UAM), near West Dock 12 and 24 June 1984 (PDM, DPR, BAC) and 10 June 1992 (RF, JL, et al.), near the PBOC 7 July 1992 (KTK, CJH), and at Prudhoe Bay 21 June 1990 (KK), 19 June 1991 (RF), and 16 July 1991 (JL).

Delichon urbica. Common House Martin. One record, of one bird observed at Spy Island just east of the Colville River delta on 11 June 1983 (SRJ). This is the first record for Alaska's north slope and one of four total for the state (D. D. Gibson pers. comm.).

Perisoreus canadensis. Gray Jay. CF: One record, of a bird seen near TAPS Happy Valley camp 25 May 1976 (WCH). West and White (1966) reported, "It is reasonable to believe this species is not rare along the Colville River, and probably breeds there."

Pica pica. Black-billed Magpie. PB: One record, of three birds seen at Oliktok Point 27 May 1977 (Johnson and Richardson 1980). CF: One record, of a bird seen near the mouth of Accomplishment Creek in the Sagavanirktok River valley 29 July 1970 (Sage 1974).

Corvus corax. Common Raven. PB: Fairly common resident, nesting uncommonly on buildings and other man-made structures throughout the oil field. FB and CF: Fairly common breeder; for example, a pair nested on the trans-Alaska pipeline near TAPS PS 3 during summer 1980 (CJH).

Phylloscopus borealis. Arctic Warbler. CF: Rare and local breeder; for example, a pair was feeding four young in a nest on the east bank of the Sagavanirktok River 24 July 1970, and another was nesting 3 km from that site 5 July 1971 (Sage 1974). The Sagavanirktok River is probably at the eastern edge of the species' breeding range.

Luscinia svecia. Bluethroat. PB: One record, of a female 13 km south of Prudhoe Bay 9 June 1980 (CJH). FB: Rare and local breeder; for example, one female with a juvenile was near the Toolik River just west of Franklin Bluffs 16 July 1981 (BJM). CF: Rare and local breeder. A breeding colony of eight to ten pairs discovered at Mile 368 along the Dalton Highway, near Happy Valley, during the mid-1980s has been monitored annually since. The Bluethroat's breeding locations become progressively rarer east of the Sagavanirktok River (Gabrielson and Lincoln 1959, Johnson and Herter 1989).

Oenanthe oenanthe. Northern Wheatear. PB: Five records, of single birds at Point Storkersen 8 June 1972 and 1 July 1975 (Bergman et al. 1977), at Prudhoe Bay 23 August 1981 (DMT), and in the Colville River delta 7 June 1975 and 28 May 1976 (Kessel and Gibson 1978). FB: Rare visitant; for example, one bird at the study site in late July 1980 (WCH, RAG, DAG). CF: Uncommon local breeder; for example, Sage (1974) reported a pair above 900 m elevation near Section Creek, a tributary of the upper Sagavanirktok River, on 29 July 1969 and two pairs at different locations in Atigun Valley 20 June 1970. DRS reported several sightings and nests in the Toolik Lake area and numerous sightings at the headwaters of the Atigun River from May to August in 1977, 1978, 1979, and 1981. WDS and JPM reported Wheatears to be common in Atigun Valley on alpine tundra, 9 August 1977.

Catharus minimus. Gray-cheeked Thrush. PB: Rare visitant; for example, single birds were seen 13 km south of Prudhoe Bay 7 June 1972 (WCH) and 31 May 1976 (WCH, KLB); another was in an oil-company camp early in June 1980 (SGJ). FB: Rare local breeder; for example, one adult with a juvenile near the Toolik River 16 July 1981 (BJM). CF: Rare (probable breeder). Breeds regularly in willows along many streams draining Alaska's north slope (Kessel and Gibson 1978).

Catharus ustulatus. Swainson's Thrush. PB: Two records. One bird first seen at an oil-company camp 3 June 1978 was found dead 7 June (SGJ); another was at Prudhoe Bay 31 May 1990 (KK et al.).

Turdus migratorius. American Robin. PB: Rare vistor, observed primarily in spring. For example, a pair was at an oil-company camp 2 June 1972 (WCH), one bird was at Point Storkersen prior to and on 30 May 1973 (Bergman et al. 1977), apparently one bird was seen repeatedly at an oil-company camp 31 May–4 June 1978 (SGJ), and one was observed at Oliktok Point from 9 June to 16 July 1993 (PDM, JB, USFWS). CF: Uncommon breeder (Sage 1974, DPR, CJH).

Ixoreus naevius. Varied Thrush. PB: Rare visitant; for example, one bird was seen at Point Storkersen 22 July 1978 (RCK, DBM, UAM) and another was at Simpson Lagoon 7 September 1977 (Johnson and Richardson 1980).

Motacilla flava. Yellow Wagtail. PB: Uncommon visitant (occasional breeder). Pairs were found nesting on the banks of the Kuparuk River in June 1986 (DMT, CJH et al.) and on 13 July 1992 (CJH). Earliest spring arrival date 31 May, in 1983 in the Colville River delta (Renken et al. 1983) and in 1975 on the Sagavanirktok River (Kessel and Gibson 1978). FB: Fairly common breeder, nesting regularly along the Sagavanirktok River. CF: Fairly common breeder (Sage 1974, DRS, TCR).

Anthus cervinus. Red-throated Pipit. PB: Two records, of one female seen near Point Storkerson 15 June 1992 (JL) and a male observed at Heald Point 10–15 June 1993 (KTK et al.). The Red-throated Pipit is very rare on Alaska's north slope, breeding uncommonly only in western Alaska (Kessel and Gibson 1978).

Anthus rubescens. American Pipit. PB: Rare visitant. Late records for the Canning River delta 25 August 1979 and 28 August 1980 (Martin and Moitoret

1981). FB: Rare visitant (possible breeder on bluffs). Five birds seen in late July 1979 (CJH, SGJ, MAP, AH) but no evidence of breeding. CF: Uncommon visitant (possible breeder). Locally common along Dalton Highway from Atigun Pass to 20 km north of Toolik Lake 9 August 1977 (WDS, JPM).

Lanius excubitor. Northern Shrike. CF: Uncommon breeder. Sage (1974) reported four juveniles on the Sagavanirktok River near the mouth of the Ivishak River on 24 July 1969 and single adults near confluence of the Lupine and Sagavanirktok rivers on 19 September 1969, in Ivishak Valley on 5 June 1970, in Atigun Valley on 20 June 1970, and at the east end of Atigun Valley on 23 June 1970. DRS saw one attacking a passerine near Happy Valley in September 1980. TCR saw a single bird in same area 9 May 1983. BJM saw one between TAPS PS 3 and 4 on 24 June 1981. GE, PK, JK, CM, and DRS found an abandoned nest with eggs and another nest with an adult attending young in Atigun Valley in spring 1980.

Sturnus vulgaris. European Starling. PB: One record, of a bird that summered in the Colville River delta in 1979 (JWH).

Vermivora celata. Orange-crowned Warbler. PB: One record, of a bird in the Colville River delta during mid-September 1975 (Kessel and Gibson 1978). CF: One record, of a bird at Happy Valley 27–28 May 1976 (Kessel and Gibson 1978).

Dendroica petechia. Yellow Warbler. PB: Two records, of two birds in the Colville River delta 6 June 1974 (Kessel and Gibson 1978) and one bird at Simpson Lagoon 5 September 1977 (Johnson and Richardson 1980). CF: One record, of a male at Mile 68 of the Trans-Alaska pipeline 23 June 1981 (LGB, TGT, UAM).

Dendroica coronata. Yellow-rumped Warbler. PB: Three records, of one bird near Deadhorse 7–13 June 1975 (WCH, KLB), one female at Oliktok Point 17 June 1971 (Hall 1975), and one Myrtle Warbler at Oliktok Point 9 June 1993 (PDM, JB, USFWS).

Dendroica palmarum. Palm Warbler. PB: Two records, of one bird at West Dock 24–25 September 1991 (Gibson and Kessel 1992) and one bird on the outer coast near Point Storkerson 3 June 1992 (MB, JY).

Dendroica striata. Blackpoll Warbler. PB: Three records, of one bird in the Sagavanirktok River delta 10 September 1981 (RLS), one adult male near West Dock 11 and 15 June 1984 (DMT, CJH, DPR), and another male at Oliktok Point 6 July 1993 (PDM, JB, USFWS).

Mniotilta varia. Black-and-white Warbler. PB: One record, of an immature bird seen in the Colville River delta 10–12 October 1977 and found dead a week later (Kessel and Gibson 1978).

Setophaga ruticilla. American Redstart. PB: One record, of one in the Colville River delta 21 September 1979 (SRJ, JWH).

Seiurus aurocapillus. Ovenbird. PB: Two records. One Ovenbird seen in Sagavanirktok River delta 10 September 1981 was the first for Alaska (Gibson and Kessel 1992). Another was reported near Prudhoe Bay 29 June 1992 (RM).

Seiurus noveboracensis. Northern Waterthrush. PB: Two records, of one bird in the Colville River delta 19–26 May 1974 (Kessel and Gibson 1978) and another near West Dock 30 May 1984 (DMT, PDM).

Wilsonia pusilla. Wilson's Warbler. PB: Two records, of one bird at Point Storkersen 1 September 1973 (Bergman et al. 1977) and a female near Prudhoe Bay 11 August 1993 (RF). Probably breeds in tall shrubs along the Colville River (Kessel and Gibson 1978).

Wilsonia canadensis. Canada Warbler. PB: One record, of a bird in the oil field 24 September 1981 (RCC).

Spizella arborea. American Tree Sparrow. PB: Rare visitant; for example, single birds 13 km south of Prudhoe Bay 3–6 June 1975 (WCH, KLB) and 3–4 June 1976 (WCH), and at West Dock 23 September 1991 (EEB) and 16 June 1993 (RF). Anderson (1913) reported a nest in the Colville River delta in the early 1900s. FB and CF: Uncommon breeder.

Passerculus sandwichensis. Savannah Sparrow. PB: Uncommon breeder. Earliest arrival date 29 May 1982 in the Colville River delta (Simpson et al. 1982). FB: Fairly common breeder. Earliest arrival date 25 May 1979 (CJH, SGJ). CF: Fairly common breeder. Earliest arrival date 24 May 1976 (WCH).

Passerella iliaca. Fox Sparrow. PB: Three records, of single birds at Point Storkersen 9 June 1972 (Bergman et al. 1977), at the oil-company camp 31 May 1978 (SGJ), and at Prudhoe Bay 30 September 1989 (EEB). Hall (1975) reported the Fox Sparrow to be common in dense brush between Umiat and Ocean Point on the Colville River from 23 to 27 June 1971.

Melospiza lincolnii. Lincoln's Sparrow. PB: Three records, of one bird in the Colville River delta 21 July 1982 (Simpson et al. 1982), one at West Dock 25 and 29 September 1991 (EEB), and another near West Dock 12 June 1992 (RF).

Zonotrichia albicollis. White-throated Sparrow. PB: Two records, of an adult photographed in the Colville River delta 5 July 1973 (Kessel and Gibson 1978) and another observed at Brownlow Point at the eastern edge of the region 17–28 August 1980 (PDM).

Zonotrichia atricapilla. Golden-crowned Sparrow. PB: Two records, of one bird in the Colville River delta 6 June 1976 (Kessel and Gibson 1978) and one seen near Point Storkerson 12 June 1992 (RF, JL). CF: Two records, of one bird in Atigun Valley 17 July and possibly another individual in the same general area 17–18 August 1980 (GE, PK, JK).

Zonotrichia leucophrys. White-crowned Sparrow. PB: Uncommon visitant. Several records, mostly during spring and fall. FB and CF: Uncommon breeder.

Zonotrichia querula. Harris' Sparrow. PB: Two records, of a female in the Colville River delta 19–25 June 1958 (Kessel and Gibson 1978) and a bird observed on Spy Island just east of the Colville River delta 4 and 6 June 1983 (SRJ).

Junco hyemalis. Dark-eyed Junco. PB: Rare spring and fall migrant and visitant. Most records are for spring, with earliest date 24 May 1981 (EEB).

Calcarius lapponicus. Lapland Longspur. PB: Abundant breeder. Typically the most common nesting passerine on Alaska's north slope (Pitelka 1974, Derksen et al. 1981, Hanson and Eberhardt 1981, Johnson and Herter 1989). Earliest arrival date 15 May 1984 iin the Colville River delta (North et al. 1984); latest records 2 September 1989 and 1990 (EEB). FB: Abundant breeder. Nesting densities lower than along coast but the species still outnumbers other nesting passerines. CF: Abundant breeder.

Calcarius pictus. Smith's Longspur. CF: Uncommon breeder. Scattered nesting pairs found in the Atigun, Sagavanirktok, and Ribdon river valleys in June 1970 (Sage 1974). Several sightings in Atigun Valley in late May 1979 and 1980 (CJH, DPR, SGJ). Smith's Longspurs nested as far north as Sagwon Bluffs during July 1978 (SGJ, KH).

Plectrophenax nivalis. Snow Bunting. PB: Abundant to common breeder. Especially abundant in construction camps, which offer numerous nest sites. Earliest

arrival date 25 April 1992; latest record 11 October 1991 (EEB). CF: Uncommon breeder. Found at higher elevations, usually above 900 m (Sage 1974).

Agelaius phoeniceus. Red-winged Blackbird. CF: One record, of a female reported at the confluence of the Sagavanirktok and Ivishak rivers 4 June 1976 (Kessel and Gibson 1978).

Euphagus carolinus. Rusty Blackbird. PB: Eight records. A pair was reported at PBOC 20–30 May 1973 (Kessel and Gibson 1978). Single birds were in the Colville River delta 10 June 1969, 17 May 1971, 25 May 1976, 18 and 21 September 1976, and October 1976 (Kessel and Gibson 1978). One bird was at Prudhoe Bay 2 June 1990 (KK). A pair was seen at West Dock on 24 September 1991, and the male remained until 27 September 1991 (EEB; photo UAM). CF: One record, of one bird in Atigun Valley 3 and 8 June 1980 (GE, PK, JK, CM, DRS).

Molothrus ater. Brown-headed Cowbird. PB: One record, of an adult male in the oil field 26 June 1980 (PGC).

Leucosticte tephrocotis. Gray-crowned Rosy Finch. CF: Uncommon breeder; for example, several were seen in the upper Atigun Valley during the summers of 1979, 1980, and 1981 (CJH et al.).

Carduelis flammea and *hornemanni*. Redpoll. PB: Uncommon breeder. The unsettled status of redpoll taxonomy (Troy 1985, Knox 1988) and inconsistent separation of the two species suggested lumping of reports. Single males were 13 km south of Prudhoe Bay 21 June 1973 (WCH) and 15 June 1976 (WCH). FB and CF: Fairly common breeder.

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AGE AND SEX DETERMINATION IN THE CALLIOPE HUMMINGBIRD

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The information available to distinguish adult female and young Calliope Hummingbirds (*Stellula calliope*) is incomplete. Using any one of the many field guides currently on the market, one can identify adult males with ease, but adult females and young often present more of a problem. Few attempts have been made until now to separate adult females from young birds of either sex because the technical information this requires has not been available. Such knowledge is particularly critical given the increasing number of people licensed to capture and band birds and the need to document properly the growing number of vagrant hummingbirds.

Of the major works dealing with hummingbird identification, relatively few have dealt with the Calliope Hummingbird. Elliot (1881), Ridgway (1892, 1911), Coues (1903), and Johnsgard (1983) all noted the diagnostic shape of the middle rectrices, contracted in the middle and wider subterminally, i.e., somewhat spatulate or pandurate. Banks and Johnson (1961) addressed identification as it relates to presumed hybrid adult males, while Stiles (1971) provided criteria allowing one to distinguish both male and female Calliope Hummingbirds from other species.

Stiles' (1971) criteria to separate Calliope Hummingbirds from other hummingbird species include small size, very short bill, and a short, broad tail containing very little rufous. He also cited behavioral mannerisms, particularly the position of the tail while the bird is hovering (nearly perpendicular to the plane of body) and the degree of tail movement (held very still). The barbs of the rectrices (stiffened and flattened) differ from those of other species, as do many standard measurements. Stiles was unable, however, to find consistent plumage differences between adult female and young Calliope Hummingbirds. It can now be shown that there are consistent differences allowing distinction between young of either sex and adult females from young.

METHODS

I collected numerous Calliope Hummingbirds over a ten-year period and, through dissection, aged and sexed them. Having established a set of criteria for identification, I expanded my sample size through the use of museum specimens.

Ortiz-Crespo (1972) developed and I (Baltosser 1987) further refined a method for aging hummingbirds based on the presence and extent of corrugations on the bill. In juvenile birds, bill corrugations are obvious, being deeply incised and extending the length of the bill. This is in sharp contrast to the bills of adult birds, which lack corrugations and appear to be smoothly polished. Corrugations in subadult birds are shallow, confined to the base of the bill, and often very faint; older subadults may lack corrugations (see Baltosser 1987 for figures).

I used bill corrugations as my primary means of aging Calliope Hummingbirds, supplementing it to some extent by feather wear and plumage characteristics (e.g., buffy feather fringes, often characteristic of young birds). The molt of Calliope Hummingbirds takes place on the wintering grounds in Mexico, so in the U.S. buffy-tipped plumage is generally useful to indicate hatching-year birds only during summer and fall.

Measurements were made with 10-cm dial calipers, accurate to the nearest 0.05 mm. I tested differences among the age and sex classes for statistical significance with one-way analyses of variance (SAS Institute 1988). For each character I calculated 95% confidence intervals about the mean.

Quantitative measurements used to characterize hummingbirds were described by Baldwin et al. (1931) and depicted by Baltosser (1987). I measured the length of the exposed culmen from its tip to the point where

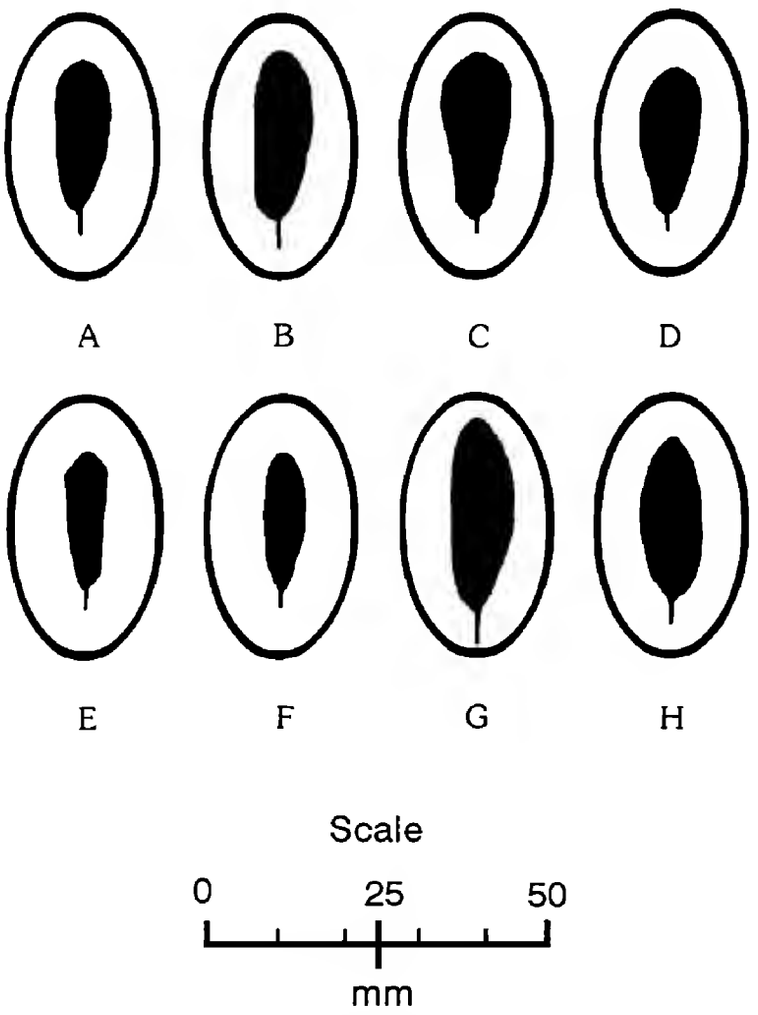

Figure 1. Diagnostic size and shape of rectrix 1 in the Calliope Hummingbird (sexes similar) compared to the size and shape of rectrix 1 in other, potentially confusing, hummingbird species (females only). A, Ruby-throated (*Archilochus colubris*); B, Black-chinned (*A. alexandri*); C, Anna's (*Calypte anna*); D, Costa's (*C. costae*); E, Calliope (*Stellula calliope*); F, Bumblebee (*Atthis heloisa*); G, Broad-tailed (*Selasphorus platycercus*); H, Rufous (*S. rufus*) and Allen's (*S. sasin*).

the feathers of the forehead impinge on the culmen. Length of wing chord was measured from the anterior edge of the wrist joint to the tip of the longest primary (number 10), without the primaries being flattened. Tail length, only to the nearest millimeter, was measured from the insertion of the two middle rectrices to the longest feather of the unspread tail. The "area" of white at the tip of the third rectrix (rectrices numbered from center out) was calculated by multiplying the length of white along the rachis by its maximum width (see Baltosser 1987).

RESULTS AND DISCUSSION

In female and young Calliope Hummingbirds the size of rectrix 1 in conjunction with its shape (expanded near the tip) is species-specific (Figure 1). In immatures, the presence of rufous along the edges of rectrix 1 is

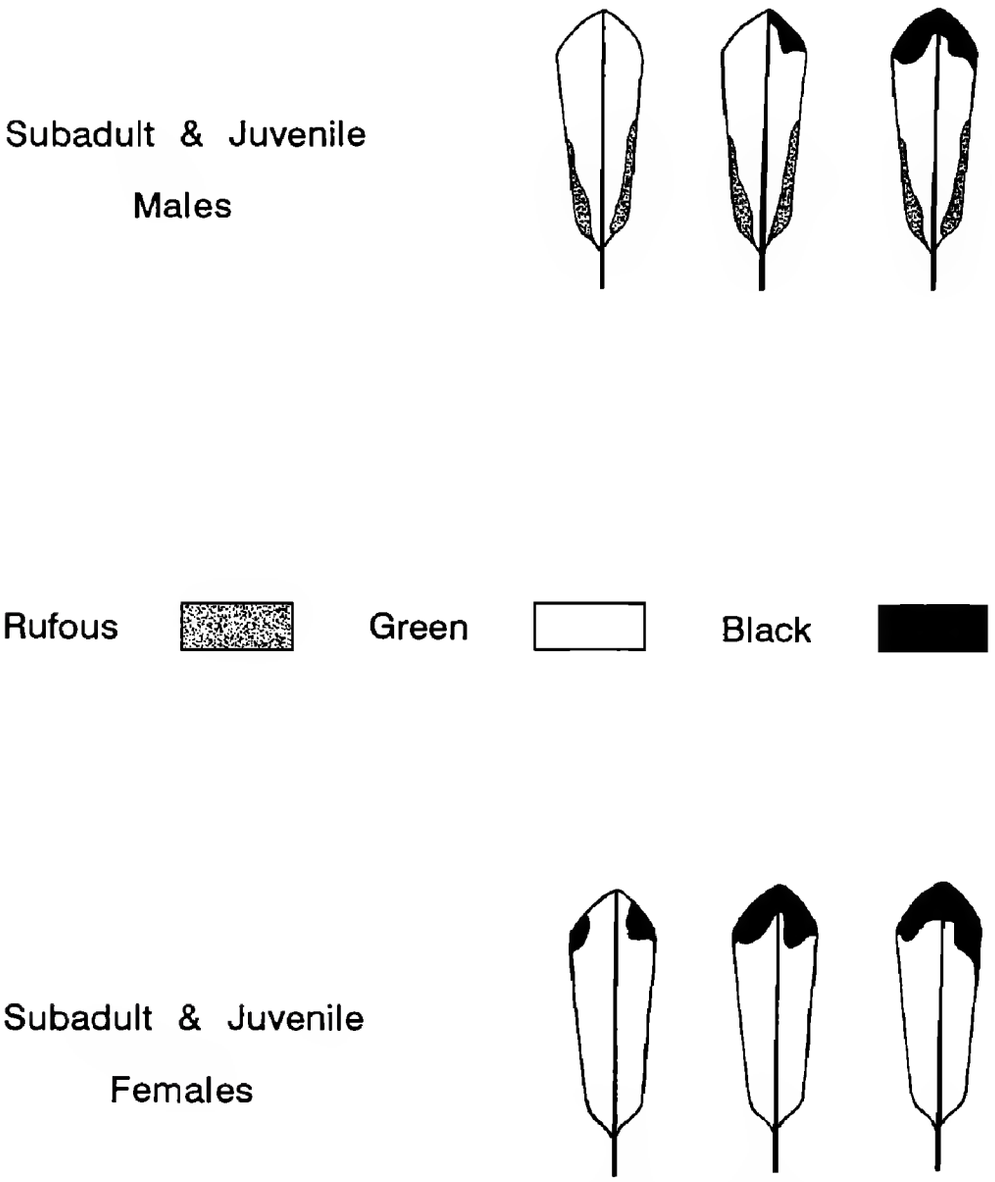

Figure 2. Diagnostic color patterns of rectrix 1 distinguishing male and female juvenile Calliope Hummingbirds. Three examples of each to show range of variation.

Table 1 Measurements of Adult Calliope Hummingbirds[a]

	Exposed culmen (mm)	Wing chord (mm)	Tail (mm)
Male			
Mean	14.20	39.55	20.20
Standard deviation	0.35	0.70	0.90
N	10	10	10
Range	13.75–14.65	38.65–40.70	19–21
95% Confidence interval	13.95–14.45	39.05–40.05	19.55–20.85
Female			
Mean	15.40	42.00	21.80
Standard deviation	0.50	0.60	0.70
N	15	15	15
Range	14.65–16.35	41.05–43.30	21–23
95% Confidence interval	15.10–15.70	41.65–42.35	21.40–22.20

[a]Differences between males and females significant in every case ($P < 0.05$).

diagnostic of males; absence of rufous is diagnostic of females (Figure 2). Adult females, however, like those of many other western hummingbirds (Baltosser 1987), show the entire spectrum of variability in rectrix 1, though they frequently exhibit at least some rufous. Sex determination is thus complicated and can be established only after aging, which in summer and

Table 2 Measurements of Juvenile Calliope Hummingbirds[a]

	Exposed culmen (mm)	Wing chord (mm)	Tail (mm)	White tip rectrix 3 (mm^2)
Male				
Mean	13.25	41.35	21.65	5.60
Standard deviation	0.50	0.90	0.75	2.00
N	16	15	14	16
Range	12.40–13.95	39.25–42.70	21–23	3.20–10.00
95% Confidence interval	13.00–13.50	40.85–41.85	21.20–22.10	4.55–6.65
Female				
Mean	14.55	43.70	22.75	17.95
Standard deviation	0.50	0.50	0.90	4.15
N	10	11	11	10
Range	13.80–15.20	42.85–44.30	21–24	11.35–26.50
95% Confidence interval	14.20–14.90	43.35–44.05	22.15–23.35	15.05–20.85

[a]Differences between males and females significant in every case ($P < 0.05$).

fall is accomplished on the basis of bill corrugations, feather wear, and buff-tipped plumage (primarily that of the head and neck).

Further complicating identification are adult females having iridescent rose-colored feathers on the throat. Such females are undescribed in popular field guides; I confirmed their sex only through careful dissection. Females with iridescent throat feathers I presume, on the basis of their extensively worn bills lacking corrugations, to be relatively old. Fortunately, few birds exhibit this condition and their small iridescent rose feathers only superficially resemble the brighter and broader gorget feathers frequently found on young males.

Measurements of adult males and females are presented in Table 1, those of immatures in Table 2. Note that all comparisons between adults are significantly different ($P < 0.05$), as are those between immatures. In addition to differences in standard measurements, young males and females are separable on the basis of the amount of white at the tip of the third rectrix.

CONCLUSIONS

In the Calliope Hummingbird the central rectrix is sufficient for species identification; plucking and preserving it can serve as documentation. The pandurate form of the central rectrix will separate Calliope Hummingbirds from Rufous (*Selasphorus rufus*), Allen's (*S. sasin*), and Broad-tailed (*S. platycercus*) hummingbirds and from members of the genera *Calypte*, *Archilochus*, and *Atthis*. The Bumblebee (*A. heloisa*) and Wine-throated (*A. ellioti*) hummingbirds of Mexico resemble the Calliope, which occurs in the former's range in migration and winter, but their central rectrices are smoothly tapered, not pandurate (Figure 1).

Calliope Hummingbirds may be sexed on the basis of the central rectrix once they have been aged. Aging is easily accomplished during summer and early fall by examining the bill for the presence or absence of corrugations. On wintering grounds in Mexico, aging is more problematic, as knowledge of feather wear and molt sequence must be considered.

Wagner (1957) described the molt of Calliope Hummingbirds as occurring during March and April. He reported no data for species like the Black-chinned (*Archilochus alexandri*), which nests in the western United States and presumably follows a migratory route similar to the Calliope's to wintering areas in Mexico. Most Black-chins molt between November and March (pers. obs.), so I suspect that the Calliope's molt is underway before March. Determining the age of female Calliope Hummingbirds may thus be difficult after October if bill corrugations and buffy feather fringes have been lost.

ACKNOWLEDGMENTS

I thank the U.S. Fish and Wildlife Service for continued support of the many ongoing research projects dealing with hummingbirds with which I am involved. Data such as that presented in the present paper would not be available without the banding and collecting privileges extended to me. Various state wildlife agencies,

most notably the New Mexico Department of Game and Fish, have also made this work possible. For making additional comparative material available I thank the staff at the Denver Museum of Natural History. Editorial suggestions provided by Philip Unitt were very constructive and much appreciated.

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NOTES

LATE NESTING OF THE CALIFORNIA GNATCATCHER

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The nominate subspecies of the California Gnatcatcher (*Polioptila californica*) has recently been listed as a threatened species under the federal Endangered Species Act (Salata 1993). Atwood (1992) estimated the subspecies' population in the United States, as of 1991, at between 1811 and 2291 pairs. Critical to management and protection of the California Gnatcatcher is a clear understanding of its nesting phenology.

On 30 July 1991, at Reef Point, Crystal Cove State Beach, Orange County, California, we discovered a California Gnatcatcher nest containing four naked, blind nestlings that had hatched about two days earlier and were gaping actively. On 15 August 1991, the nest was empty, still in good shape, but slowly being plundered by ants. A pair (i.e., adult male and female) and a juvenile were seen about 50 m to the north and another two birds were foraging 75 m to the south. We infer that the young probably fledged on 12 or 13 August. In addition, Ray Vizgirdas (pers. comm.) reported a fledging date of 25 August from a nest at Oak Canyon Nature Center, Orange County.

These observations extend the late extreme date for nesting in this species to mid- to late August, a full month to six weeks after Woods' (1949) latest date of 12 July (a nest containing "four well-grown young") and later than the vague "through July" reported by Atwood (1990). The latest of Roach's (1989) 34 nests was in the first week of July, while Bontrager (1991) found that nesting activity in southern Orange County was concluded by mid-July.

We examined 101 data cards for museum egg sets, mostly at the Western Foundation of Vertebrate Zoology and the San Bernardino County Museum, with a few from the Museum of Vertebrate Zoology, the San Diego Natural History Museum, and the Santa Barbara Museum of Natural History. The latest estimated clutch completion date was 10 July (for a nest in coastal San Diego County, California), implying a fledging date of about 7 August.

The mean estimated clutch completion date of the sets was 5 May (standard deviation = 21.7 days), figured by subtracting 2 days from the collection date for sets in which incubation was slight, 5 days for sets in which embryos were taking shape, 9 days for sets about half incubated, and 12 days for sets in which incubation was advanced. The majority of egg sets were collected within a few days of the final egg being laid, with 47 (43%) labeled "fresh" and 29 (27%) labeled as incubation "slight." Historic egg collections, however, do not constitute a random sample. Whereas early dates are well represented, late dates tend to be represented very poorly (McNair 1987, L. F. Kiff in litt.).

We suspect that California Gnatcatchers nest into August more frequently along the immediate coast, where daytime temperatures in summer average cooler than they do farther inland.

We thank Eugene A. Cardiff (San Bernardino County Museum), Tamar Danufsky (Santa Barbara Museum of Natural History), Ned K. Johnson (Museum of Vertebrate Zoology), Lloyd F. Kiff (Western Foundation of Vertebrate Zoology), and Philip Unitt (San Diego Natural History Museum) for allowing us access to California Gnatcatcher

egg set data in their care. Richard A. Erickson (LSA Associates), Stephen J. Myers (Tierra Madre Consultants), and Ray Vizgirdas (U. S. Fish and Wildlife Service) kindly provided nesting information they have gathered in Orange and western Riverside counties. Richard A. Erickson, Lloyd F. Kiff, and Philip Unitt reviewed a draft of this note and greatly improved its content.

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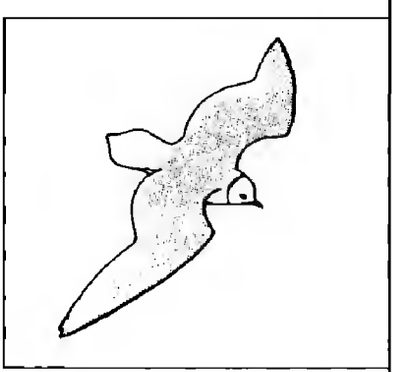

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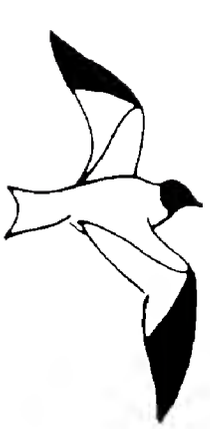

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Cover photo by © Shawneen Finnegan of Goleta, California: Fork-tailed Flycatcher *(Tyrannus savana)*, Bridgehaven, California, September 5, 1992. First confirmed record for California.

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WESTERN BIRDS

Volume 25, Number 3, 1994

STATUS OF THE FORK-TAILED FLYCATCHER (*TYRANNUS SAVANA*) IN THE UNITED STATES AND CANADA

GUY McCASKIE, 954 Grove Street, Imperial Beach, California 91932

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The Fork-tailed Flycatcher (*Tyrannus savana*) breeds in Middle and South America and occurs in North America as a vagrant. Monroe and Barron (1980) summarized 40 reports of Fork-tailed Flycatchers in the United States and Canada and concluded that "North American vagrants . . . have been presumed to be vagrants that 'overshot' their normal 'wintering' grounds in northern South America." While they noted some movements that did not fit this pattern, they offered no hypotheses to explain them. Furthermore, whereas they noted "that most North American reports pertain to the nominate subspecies" (Bond 1940), they did not discuss ageing of these vagrants.

Our review of *American Birds* and other sources reveals 63 additional reports through 1992, bringing the total number reported in the United States and Canada to over 100 (Appendix). The authenticity of some of these reports has been questioned, leaving 94 records we consider valid. Aside from two birds seen together near Florida City, Florida, on 15 September 1984 (*Am. Birds* 39:44, Powell 1986, B. H. Anderson in litt.), all accepted records involve single individuals, although two were within 15 miles of each other on Cape Cod, Massachusetts, during the fall of 1980 (*Am. Birds* 35:159).

Our analysis of these records suggests that the proposal by Monroe and Barron (1980) only partly explains the movement of this species into the United States and Canada, as there is a marked contrast between the occurrence pattern along the Gulf of Mexico and that along the Atlantic coast, in the Midwest, and in New England. In attempting to explain these movement patterns, we also examined ageing criteria and subspecific identification, both of which shed light on the issue.

PATTERN OF OCCURRENCE

Sixty-six of the Fork-tailed Flycatchers found in the United States and Canada were along the Atlantic coast from Florida north to Nova Scotia (Figure 1), with more than 85% of these north of the Carolinas. Eleven more were in the interior, west to Dorion, Ontario (Goodwin 1978), Duluth, Minnesota (Svingen 1991), Columbia County, Wisconsin (Freese 1979), and Henderson, Kentucky (Audubon 1834, Mengel 1965). In addition, 14 have been recorded along the Gulf of Mexico from the southwestern tip of Florida to southern Texas, with five of these in Florida and seven in Texas. In the western United States and Canada, one was seen at Drumheller, Alberta, on 1 June 1988 (Wedgwood 1989), one was photographed near Picabo, Idaho, between 25 August and 7 September 1991 (Trost 1991), and a third was photographed at Bridgehaven near the mouth of the Russian River on the north-central coast of California between 4 and 8 September 1992 (*Am. Birds* 47:146, 1993). One reportedly shot near Santa Monica, California, in the "latter part of the summer" of 1883 (Toppan 1884) cannot be verified, because the specimen was destroyed by fire in 1896 (Grinnell 1915).

Fifty-six of the 77 Fork-tailed Flycatchers (the single Vermont record cannot be assigned to season) along the Atlantic coast and inland to Ontario, Minnesota, Wisconsin, and Kentucky have appeared in fall between 23 August (Meritt 1970) and 1 December (Knight 1910), with the majority during September and October (Figure 2). This is the time when the nominate subspecies should be migrating from wintering grounds in northern South America to breeding grounds in southern South America. We propose that these birds flew a latitudinal mirror-image misoriented migration route northwest instead of southwest during the austral spring.

Twenty Fork-tailed Flycatchers have been found along the Atlantic coast and inland to Minnesota and Wisconsin in spring and summer between 2 May (*Am. Birds* 44:398) and 17 July (*Kingbird* 37:206). We propose that these birds overshot their winter grounds when migrating northward during the austral fall migration. One found near Rustic, Virginia, on 3 June 1988 remained through 1 August (Williams 1988), during which time it molted. Late June and July birds, such as those photographed in eastern Douglas County, Wisconsin, on 24 June 1988 (Johnson 1989) and on Cape Breton Island, Nova Scotia, on 25 June 1984 (Tufts 1986), and one videotaped at Loxahatchee National Wildlife Refuge, Florida, on 13 and 14 July 1992 (J. L. Baker in litt., B. H. Anderson in litt.), may have arrived earlier than when found and simply have been wandering in search of suitable "wintering" localities. One reportedly collected at Lake Ridge, Michigan, in July 1879 also fits this pattern of occurrence, but the specimen is no longer extant, and the record has been questioned (Barrows 1912).

Although the sample size is small (n = 3), the seasonal occurrence of Fork-tailed Flycatchers in the western United States and Canada appears similar to that for the Atlantic coast, with two records for fall and one in early June.

The species' seasonal occurrence along the Gulf of Mexico, however, is quite different, with eight individuals found in spring/summer but only two

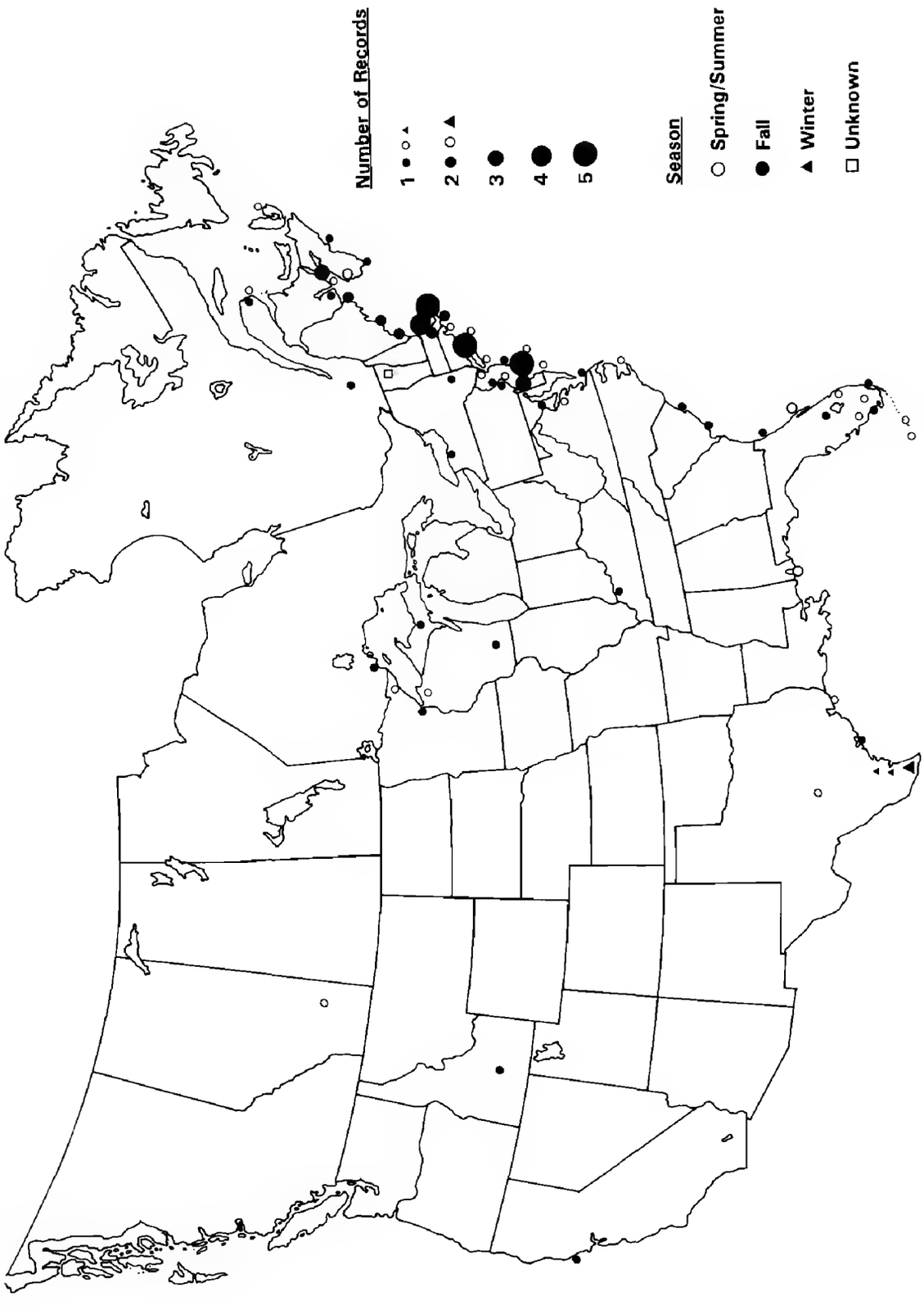

Figure 1. Distribution of Fork-tailed Flycatcher occurrences in the U.S. and Canada.

in fall (Figure 2). Spring dates of occurrence extend from 20 April (Bremser and Duncan 1992) to 15 July (*Am. Birds* 28:895), whereas the fall dates are 8 October (Oberholser 1974) and 17 October (*Am. Birds* 31:168). In addition, four individuals have been found in Texas in winter between 4 December (*Am. Birds* 44:293) and 4 February (James 1963). A report for March was not accepted by the Texas Bird Records Committee (G. W. Lasley in litt.).

SUBSPECIES

Four subspecies of the Fork-tailed Flycatcher have been described (Zimmer 1937) and are currently recognized (Traylor 1979). The highly migratory nominate race breeds as far south as the southern tip of Argen-

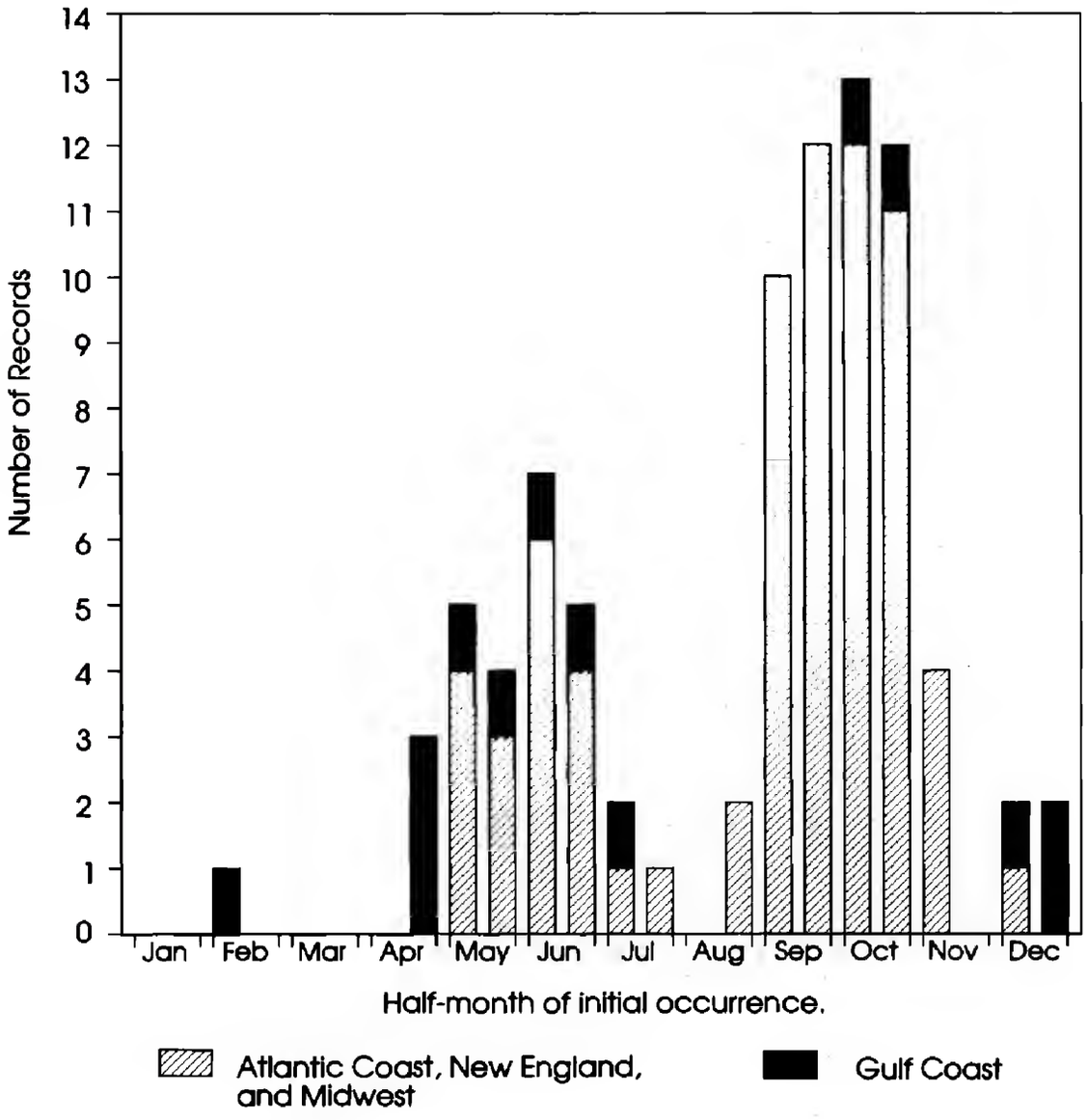

Figure 2. Seasonal distribution of dated records of the Fork-tailed Flycatcher, by half-month, along the Atlantic coast, in New England, and in the Midwest compared to seasonal occurrence along the Gulf of Mexico.

tina and the Falkland Islands, withdrawing to extreme northern South American during the austral winter. The partially migratory northern race *monachus* breeds from southern Mexico south to north-central Brazil, with some birds withdrawing southward from the northern part of this range in our winter. The other two races are reported as resident, *sanctaemartae* along the Caribbean coast of Colombia and extreme northwestern Venezuela and *circumdatus* in the Amazon basin of Brazil (Traylor 1979).

Although Zimmer stated that *monachus* is "readily separated" from nominate *savana* by its "much paler gray" back, this distinction is often not apparent without birds in hand (Hilty and Brown 1986). Back color is greatly affected by wear, however, with worn *monachus* being as dull as fresh *savana* (J. V. Remsen in litt.). Zimmer also stated *monachus* typically shows a "more whitish collar," but Patten's examination of 84 skins at the Natural History Museum of Los Angeles County (LACM; $n = 74$) and the Western Foundation of Vertebrate Zoology (WFVZ; $n = 10$) showed a great deal of variability in this feature (seasonal wear was taken into account), with one nominate bird having a nearly complete white collar. The visibility of a collar depends on specimen preparation, however, making this feature difficult to judge on skins. In addition, Zimmer stated that *monachus* generally lacks the gray flanks that contrast with the white breast on *savana*. The most useful feature, however, is the shape of the two outermost primaries on adult male *savana*, which are more deeply emarginated than those on adult male *monachus*. Also, the 8th primary on adult male *monachus* shows almost no emargination, whereas this feather is as deeply notched as the outermost two on *savana*. Both *sanctaemartae* and *circumdatus* are similar to *monachus* in back coloration. Adult males of *sanctaemartae* have almost no emargination on the outer four primaries, whereas adult males of *circumdatus* have the deepest emargination on the outer two primaries of any of the four races. Because emargination is next to impossible to ascertain in the field, identification to subspecies on this basis without the bird in hand or clear in-flight photographs (e.g., *Am. Birds* 47:146), is questionable.

Most Fork-tailed Flycatchers reaching the United States and Canada are believed to be of the highly migratory nominate subspecies. Specimens (see Appendix for abbreviations) from Maine (life mount; BMS X03.163), Pennsylvania (FMNH 304056), and New Jersey (specimen lost) have been identified as *savana* (Bond 1940). Birds from Michigan (UMMZ 206495) and Texas (LSUMZ 25116) have also been identified as the nominate subspecies. The bird in Virginia during the summer of 1988 underwent a complete molt during its stay (*Am. Birds* 43:79), strongly suggesting that it also was of the nominate race, because June and July is the time of the year this subspecies molts.

Monroe and Barron (1980) suggested that an adult male (ANSP 35423) labeled "New Jersey," with no date or specific locality, to be the specimen taken at Trenton, New Jersey, in fall 1900 (Babson 1901). This specimen was identified as *sanctaemartae* by John T. Zimmer (Bond 1940). Monroe and Barron (1980) questioned this identification, but apparently did not examine the skin. Mark B. Robbins examined this specimen at our request. Robbins stated (in litt.) that its back color is light like that of *sanctaemartae*

and that the shapes of the outer three primaries match those of *sanctaemartae*. Thus, this specimen is problematic, suggesting three possibilities: *sanctaemartae* is not as sedentary as generally believed, the specimen is incorrectly attributed to New Jersey, or the characters diagnosing Fork-tailed Flycatcher subspecies are not as definitive as Zimmer (1937) indicated.

A Fork-tailed Flycatcher photographed at Rio Hondo, Texas, between 17 December 1984 and 16 January 1985 (TPRF 353) and an "adult" photographed near Ricardo, Texas, between 18 and 26 December 1988 (TPRF 732) were identified as *monachus* by J. V. Remsen (*Am. Birds* 43:232; in litt.), in part because they were bright birds in fresh plumage; birds of the nominate race would be quite worn in winter. It is possible that most of the "winter" birds in Texas are of this race, moving northward from Mexico after the nesting season; however, the only Texas specimen (LSUMZ 25116) is a nominate bird taken near Edinburg in February (James 1963).

AGEING

Popular guides (e.g., Peterson and Chalif 1973, Scott 1987) indicate that immature Fork-tailed Flycatchers can be distinguished from adults by their shorter tails. Although immatures have shorter tails than adults, tail lengths of immature males and adult females overlap considerably. Only very young birds with exceedingly short tails prior to their post-juvenal molt, such as young *savana* encountered in spring and young *monachus* encountered in early winter, can be safely aged on the basis of their short tails alone (they can wander while in this plumage). Fork-tailed Flycatchers acquire long tails during their first molt, making tail length an unreliable character for ageing most birds, particularly nominate birds found in the United States and Canada in fall, all of which should have completed their post-juvenal molt. We believe misleading information in field guides has led observers to identify first-year birds as adults and resulted in erroneous age data appearing in the literature.

Zimmer (1937) stated that short-tailed juveniles, prior to their post-juvenal molt, have brownish rather than black caps, much brown in the wings, a generally brownish wash to the upperparts, a light buffy wash on the underparts, and extensive brown rather than black on the rump and uppertail coverts. Long-tailed first-year birds, following their post-juvenal molt, are stated to have black caps, gray backs, and clean white underparts like adults. First-year birds retain wide brown or cinnamon fringes on the wing coverts, whereas adults have the wing coverts thinly fringed with gray. Furthermore, first-year birds typically retain some brown on the rump, whereas adults have entirely black rumps. Few guides address wing-covert or rump coloration, but Blake (1953) included the fact that first-year birds have brown fringes on the coverts, and Stiles and Skutch (1989) noted that adults have gray fringes. Stiles and Skutch also indicated that the brown rump is present only on "young" (= juvenile) birds. Meyer de Schauensee (1970) mentioned the black rump of adults but did not indicate the rump color of immatures. Patten's examination of 84 skins in LACM and WFVZ confirmed these criteria, as all young birds showed cinnamon-brown fringes

to their wings and upper tail coverts. Fresh-plumaged adults, by contrast, had thin but distinct gray fringes concentrated at the tips of the wing coverts, and all had black uppertail coverts.

In addition to the differences in the wing and uppertail coverts, immatures do not have as extensive a yellow crown patch as adults; because this feature is difficult to see, even on adults, it is probably of little use for ageing birds in the field. Steven W. Cardiff and J. V. Remsen (in litt.) suggested that the color of the cap is a valid character for ageing Fork-tailed Flycatchers, the cap being brownish on juveniles, black without shine or gloss on first-year birds, and shiny or glossy black on adults.

Brown visible on the rump and uppertail coverts and extensive brown fringes on the wing coverts on the recent California bird (see the cover photograph) suggests that it was a nominate bird in its first "spring" (our fall), having hatched during our winter. Monroe and Barron (1980) reported at least three fall Fork-tailed Flycatchers prior to 1980 as immature (Monroe and Barron 1980), and at least eight more since that time were reported as immature or first-year. Two of the six extant specimens taken in the United States are immatures (B. Kochancz pers. comm., J. V. Remsen in litt.), three are adults (R. W. Storer in litt., D. Willard in litt. M. B. Robbins in litt.), and the Vermont specimen has not been aged. Our review of photographs published in *American Birds* and various regional publications suggests that many fall birds were immatures, including some reported as adults, presumably because they had long tails. We suspect that most fall Fork-tailed Flycatchers in the United States and Canada are immature birds of the nominate race that have flown north instead of south during their first "spring" migration. We also suspect that birds occurring in spring and summer are short-tailed juveniles and full-tailed adults which overshot their wintering grounds during "fall" migration.

Short-tailed individuals in Texas in winter are likely first-year birds of the northern race *monachus* that moved north instead of south during their first attempt at migration. Similar northward winter movement from Mexico has been found in a number of other passerines, such as the Clay-colored Thrush (*Turdus grayi*), Golden-crowned Warbler (*Basileuterus culicivorus*), Crimson-collared Grosbeak (*Rhodothraupis celaeno*), and Blue Bunting (*Cyanocompsa parellina*).

SUMMARY

The status of the Fork-tailed Flycatcher in the United States and Canada is still much like that determined by Monroe and Barron (1980). Most records are believed to involve birds of the nominate race *savana*, which breeds in southern South America and spends the austral winter in northern South America. It appears that there is a specimen of the "sedentary" South American race *sanctaemartae* attributed to New Jersey, and photographs of what are believed to be *monachus* from Texas.

Most Fork-tailed Flycatchers occur along the Atlantic Coast in fall from southern Florida to as far north as the Gaspé Peninsula in Quebec, with a few individuals inland to as far north as southern Ontario and west to the coast of California, but only an occasional individual along the Gulf of

Mexico. We suspect that the majority of these birds are first-year individuals that have flown north instead of south during the austral spring migration.

A smaller number occur over the same area in spring, with one reaching as far north as south-central Alberta, but with a higher percentage along the Gulf of Mexico. We believe these birds are juveniles and adults that overshot their wintering grounds in northern South America during the austral fall migration.

Individuals occasionally attempting to winter in south Texas are believed to include immature *monachus* that have moved north as post-breeding wanderers from Mexico.

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APPENDIX. Records of the Fork-tailed Flycatcher for the United States and Canada through 1992.

Numbered records we consider valid; we question the nine unnumbered records because they lack sufficient details or because they have been questioned by regional authors or records committees. Comments give the disposition of specimens and photographs; if neither of these is specified, the record is a sight record. Four of the earliest of the eleven specimens taken in the United States are known lost, and

another reported extant by Monroe and Barron (1980) cannot be located, so we presume it is lost also. Furthermore, some early sight records lack documentation; for example, only seven of the eleven reported from Texas have been accepted by the Texas Bird Records Committee (G. W. Lasley in litt.). Even so, the validity of only three pre-1900 reports of Fork-tailed Flycatchers has been questioned, even though none of the eight includes specific dates and/or locations. Abbreviations: AB, *American Birds*; AFN, *Audubon Field Notes*; ANSP, Academy of Natural Sciences of Philadelphia; BMS, Boston Museum of Science; CBRC, California Bird Records Committee (records archived at the Western Foundation of Vertebrate Zoology, Camarillo, California); FMNH, Field Museum of Natural History, Chicago; LSUMZ, Museum of Natural Science, Louisiana State University, Baton Rouge; NP, National Park; NWR, National Wildlife Refuge; TPRF, Texas Photo Record File, Texas A&M University, College Station; UMMZ, University of Michigan, Museum of Zoology, Ann Arbor; UVM, University of Vermont Museum, Burlington; WWF, Welder Wildlife Foundation, Sinton, Texas.

1. Late October, year?; Henderson, Ky. (Audubon 1834, Mengel 1965). Specimen lost.

2. Early December, ca. 1820; Bridgeton, N. J. (Bonaparte 1825, Leck 1984). Specimen said to be extant by Monroe and Barron (1980), but its whereabouts are unknown (B. L. Monroe, Jr., in litt.); Bonaparte (1825) published a sketch of it.

   August 1822 (2 birds); near Natchez, Miss. (Audubon 1834). Identification dubious (W. H. Turcotte in litt.).

3. June 1832; Camden, N. J. (Audubon 1834, Leck 1984). Specimen lost, but Audubon (1834) painted it.

4. Fall 1873; Fox Chase, Pa. (Bond 1940, Poole 1964). Specimen (FMNH 304056). Adult *T. s. savana*.

   July 1879; Lake Ridge, Mich. (Barrows 1912). Alleged specimen lost; questioned by Barrows (1912).

   Late summer 1883; Santa Monica, Calif. (Toppan 1884). Alleged specimen lost; record has been questioned (Grinnell 1915).

5. 1884?; Vermont (W. G. Ellison in litt.). Specimen. A previously unpublished record for Vermont based on a life mount at UVM labeled only "Vt." (i.e., there is no other collection data). Walter G. Ellison stated (in litt.) that "this record is uncertainly attributed to Vermont and has no definite date and locality associated with it." Nevertheless, he presented a "plausible story" that a Scissor-tailed Flycatcher (*Tyrannus forficatus*) taken by C. W. Graham in St. Johnsbury in 1884 (*Random Notes Nat. Hist.* 1(8):3, 1884) may be this Fork-tailed Flycatcher. Spear (1976) implied that the Scissor-tailed Flycatcher was deposited at Dartmouth College, but Ellison stated there is no Scissor-tailed Flycatcher at Dartmouth College, and suggested it instead ended up at the University of Vermont where it is now correctly identified as a Fork-tailed Flycatcher. The Vermont Bird Records Committee has accepted this record.

6. Fall 1900; Trenton, N. J. (Babson 1901, Bond 1940). Specimen (ANSP 35423). Considered *T. s. sanctaemartae*; see text.

7. 1 Dec 1908; Marion, Me. (Knight 1910, Bond 1940). Specimen (BMS X03.163). Immature *T. s. savana*.

8. 22 Oct 1916; Martha's Vineyard, Mass. (Foster 1917). Considered "hypothetical" by Griscom and Snyder (1955), but accepted by Veit and Petersen (1993).

9. 1–3 Nov 1939; Cape May, N. J. (Leck 1984).
10. 14 Sep 1944; East Quogue, N. Y. (Bull 1974, *Kingbird* 41:4).

    10 Aug 1946; north of Uvalde, Tex. (Peterson 1960, Oberholser 1974).

    19 Nov 1946; Rio Grande delta, Tex. (Peterson 1960, Oberholser 1974).
11. 23 Sep 1947; Heckscher State Park, N. Y. (Bull 1974, *Kingbird* 41:4).
12. 5 Nov 1952; 24 km west of Okeechobee, Fla. (Sprunt 1954).
13. 7 Oct 1954; Clermont, N. Y. (Bull 1974, *Kingbird* 41:4).
14. 8 Oct 1958; Tivoli, Tex. (Oberholser 1974). Photograph published and archived (WWF P-26).

    20 Mar 1959; Rio Grande delta, Tex. (AFN 13:308, Oberholser 1974).
15. 4 Feb 1961; near Edinburg, Tex. (James 1963). Specimen (LSUMZ 25116). Immature *T. s. savana*.
16. 26–27 Sep 1961; Martha's Vineyard, Mass. (AFN 16:10).
17. 29 May 1967; West Orange, N. J. (AFN 21:490, AFN 22:17, *N. J. Nature Notes*, Dec 1986:157).

    25 Sep 1967; Encinal Peninsula, Tex. (AFN 22:62).
18. 4–9 May 1968; Plum Island, Mass. (AFN 22:506).
19. 23 Aug 1968; Cape May, N. J. (Meritt 1970). Published photograph. Erroneously published as a Scissor-tailed Flycatcher in AFN 23:31, 1969.
20. 6–11 Sep 1970; Biddeford Pool, Me. (AB 25:29). Unpublished photograph.
21. 26 Sep 1970; Dartmouth, Nova Scotia (Tufts 1986). Unpublished photograph.
22. 4 Sep 1972; Brigantine NWR, N. J. (AB 27:39, Danzenbaker 1973).
23. 4 Sep 1972; Cape May, N. J. (*N. J. Nature News*, Dec 1972:186). Considered same as preceding record by Danzenbaker (1973), but the two locations are about 80 km apart, leading us to believe otherwise.
24. Late Oct–1 Nov 1973; Bull's Island, S. C. (Dick 1974). Published photograph.
25. 15–16 Jul 1974; Sugarloaf Keys, Fla. (AB 28:895).
26. 14–25 Sep 1975; Whiting, Me. (AB 30:24, AB 30:33). Published photograph.
27. 24–26 Aug 1976; Seal Island, Nova Scotia (Tufts 1986). Immature; published photograph.
28. 9–15 Sep 1976; Martinsville, Me. (AB 31:229, AB 31:232). Published photograph.
29. 17 Sep 1976; Rockledge, Fla. (Cruickshank 1980).
30. 1–8 Oct 1976; Kennebunk, Me. (AB 31:229). Published photograph. Considered "possibly same" as Martinsville bird (record no. 28) by Vickery (1978).
31. 17 Oct 1976; Chokoloskee, Fla. (AB 31:150, AB 31:168). Published photograph.

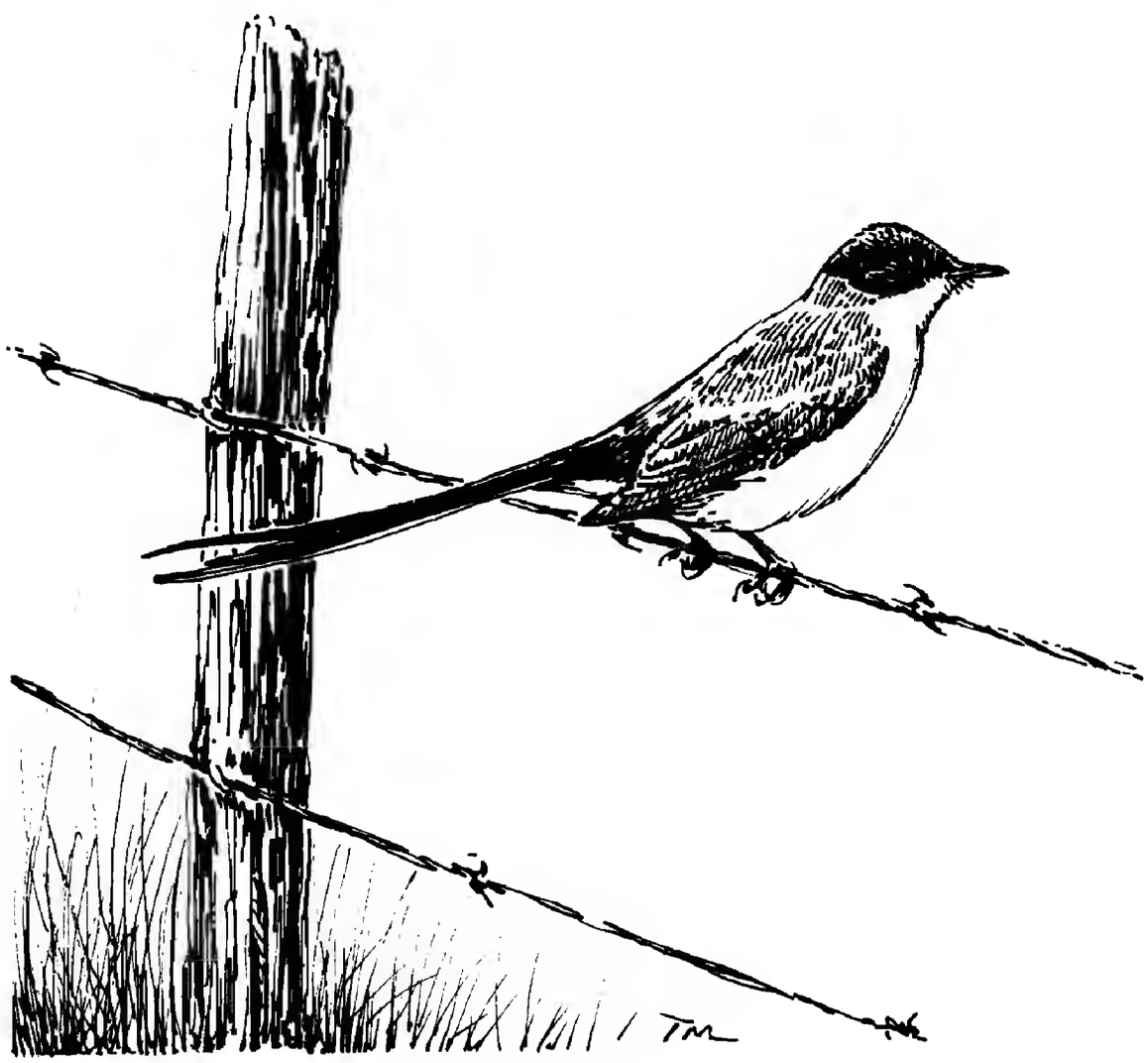
    Mid-Apr 1977; Sanibel Island, Fla. (Edscorn 1977). "Not accepted" (B. H. Anderson in litt.).
32. 28–30 Oct 1977; Dorion, Ontario (Goodwin 1978). Published photograph.
33. Late Oct–15 Nov 1977; Grand Bay, New Brunswick (Godfrey 1986).

34. 23 Sep 1978; Sandy Point State Park, Md. (Wierenga 1978). Immature; accepted (E. Wilson in litt.).
35. 11 Oct 1978; Cape May, N. J. (AB 33:162). Published photograph.
36. 22–27 Oct 1978; Queens Co., N. Y. (AB 33:162).
37. 26 Oct 1978; Suffolk Co., New York (AB 33:162).
38. 13–16 Nov 1978; Columbia Co., Wis. (Freese 1979, AB 33:180). Published photograph.
39. 22 Sep–4 Oct 1980; Chatham, Mass. (AB 35:159). First-year; published photograph.
40. 27 Sep–7 Oct 1980; Orleans, Mass. (AB 35:159). First-year; published photograph.
41. 5 May 1981; Big Cypress NP, Fla. (Britten 1984, Powell 1986).
42. 16 May 1981; Austin, Tex. (AB 35:841). Photographs published and archived (TPRF 247).
43. 22–27 Sep 1981; Chatham, Mass. (AB 36:154). Unpublished photograph.
44. 30 Jun 1982; Bonaventure Island, Quebec (AB 36:958).
45. 16–18 Sep 1982; Nantucket, Mass. (AB 37:157).
46. 6 Oct 1983; Rumely, Mich. (AB 38:206). Specimen (UMMZ 206495); adult male *T. s. savana*. The date was erroneously published as 20 Oct 1983 in AB 38:206 (R. W. Storer in litt.).
47. 18–20 May 1984; Cape May, N.J. (Dunne 1984). Juvenile; published photograph.
48. 25 Jun 1984; Cape Breton Island, Nova Scotia (Tufts 1986). Unpublished photograph.
49. 15 Sep 1984; near Florida City, Fla. (AB 39:44, Powell 1986). Two birds seen together.
50. 24 Oct 1984; Bailey Island, Me. (AB 39:28). "Remained several days."
51. 17 Dec 1984–16 Jan 1985; southeast of Raymondville, Tex. (AB 39:186, AB 40:497). Considered *T. s. monachus*; photographs published and archived (TPRF 353).
52. 6–8 Jun 1985; Garden Key, Fla. (AB 39:905). "Adult in heavy molt"; unpublished photograph.
53. 9 Oct 1985; Block Island, R. I. (AB 40:258).

    10 Oct 1985; Monroe, Me. (AB 40:258). "Undocumented."
54. 11–12 Oct 1985; Boston, Mass. (AB 40:258).
55. 19 Oct 1985; Port Mahon, Del. (AB 40:90).
56. 11 Nov 1985; Merritt Island NWR, Fla. (Dowling 1989). The 24 Nov 1985 date listed in AB 40:103 is an error (B. H. Anderson in litt.).
57. 1–7 Jun 1986; Cape Carteret, N. C. (Haberyan 1988, AB 40:458). Worn adult; published photograph.
58. 17 Jul 1986; Brooklyn, N. Y. (*Kingbird* 37:206).
59. 13 Jun 1987; Falmouth, Mass. (Veit and Petersen 1993).

60. 20–21 Jun 1987; Marshfield, Mass. (Veit and Petersen 1993).
61. 24 Apr 1988; Ft. Morgan, Ala. (Summerour 1988). Age?
62. 1 Jun 1988; Drumheller, Alberta (Wedgworth 1989).
63. 3 Jun–1 Aug 1988; Rustic, Va. (AB 43:79, Williams 1988, *Raven* 60:5–6). Molting adult; published photographs.
64. 24 Jun 1988; Douglas Co., Wis. (Johnson 1989, AB 42:1292). "Striking adult"; published photograph.
65. 4 Sep–mid-Oct 1988; Port-Menier, Quebec (AB 43:69). Published photograph taken 25 Sep 1988.
66. 23 Oct 1988; south Colleton Co., S. C. (AB 43:302). "Changing plumage."
67. 18–26 Dec 1988; near Ricardo, Tex. (AB 43:232, 43:338). Considered *T. s. monachus*; photographs published and archived (TPRF 732).
68. 7 May 1989; Oak Beach, N. Y. (AB 43:457, *Kingbird* 39:190). Unpublished photograph.
69. 27 Sep 1989; Camden, Del. (AB 44:65). Reported as an adult.
70. 29–30 Oct 1989; Apple River East, Nova Scotia (AB 44:48). Reported as an adult; published photograph.
71. 4 Dec 1989; Aransas NWR, Tex. (AB 44:293). "An apparent adult."
72. 2–3 May 1990; Concord, Mass. (AB 44:398). Discussion in *Am. Birds*; unpublished photograph.
73. 17–19 May 1990; Chincoteague, Va. (AB 44:409, Ake 1991).
74. 16–25 Jun 1990; Shark Valley, Fla. (AB 45:93, Baker 1991).
75. 26 Sep 1990; Ledyard, N. Y. (*Kingbird* 42:6).
76. 7–16 Oct 1990; Hamlin, N. Y. (Marcotte 1991, *Kingbird* 42:6, AB 45:82). Published photographs.
77. 14 Oct 1990; Cambridge, Mass. (AB 45:77).
78. 23–25 Apr 1991; Gilchrist, Tex. (AB 45:471). Reported as adult; photographs published and archived (TPRF 1001).
79. 11–14 Jun 1991; Bon Portage Island, Nova Scotia (AB 45:1089). Reported as an immature.
80. 14–20 Jun 1991; Kent Island, New Brunswick (AB 45:1089). Considered same individual as preceding in AB 45:1089, but we suspect otherwise.
81. 14 Jun 1991; Castellow Hammock Park, Fla. (*Fla. Field Nat.* 20:27).
82. 25 Aug–7 Sep 1991; east of Picabo, Ida. (Trost 1991). Published photographs.
83. 6 Sep 1991; Duluth, Minn. (Svingen 1991, AB 46:94). Published photograph.
84. 6–9 Sep 1991; West Lawrenceton, Nova Scotia [AB 46:55, *Nova Scotia Birds* 34(3):24]. Published photograph.
85. 29 Sep 1991; Cape May, N. J. (Bacinski 1992, AB 46:71). Published photograph. The 9 Sep photo caption date in AB 46:71 is an error.
86. 3 Oct 1991; Wellfleet, Mass. (*Bird Observer* 20:54).
87. 12 Oct 1991; Back Bay NWR, Va. (T. Kain in litt.). Unpublished photograph (apparently poor quality).

88. 23–24 Oct 1991; Saint-Denis, Quebec (AB 46:59)
89. 20 Apr 1992; Dauphin Island, Ala. (Bremser and Duncan 1992). Age?
90. 3–14 May 1992; Grand Marais, Minn. (Ekhof and Backstrom 1992). Worn adult; published photograph.
91. 13–14 Jul 1992; Loxahatchee NWR, Fla. (J. L. Baker in litt., B. H. Anderson in litt. Unpublished photographs; there is also a videotape of this bird in Fla. Ornithol. Soc. Records Committee files.
92. 4–8 Sep 1992; Bridgehaven, Calif. (AB 47:146). Immature; photographs published (see cover) and archived (CBRC 240-1992).
93. 9–11 Oct 1992; Horton, New Brunswick (AB 47:58). Published photograph.
94. 13 Oct 1992; Fire Island, N. Y. (AB 47:73).



Fork-tailed Flycatcher *Sketch by Tim Manolis*

AN EXTINCT SUBSPECIES OF SHARP-TAILED GROUSE FROM NEW MEXICO

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The Sharp-tailed Grouse, *Tympanuchus phasianellus* (Linnaeus), reached the southern limits of its historic range in northeastern New Mexico, where a population occupied Johnson and adjacent mesas in Colfax and perhaps Union counties (Ligon 1927, Bailey 1928). Since first reported, the New Mexico population has been variously assigned to the prairie subspecies *T. p. campestris* (Ridgway), the Columbian *T. p. columbianus* (Ord), or the high-plains form *T. p. jamesi* (Lincoln) (e.g., A.O.U. 1886, 1895, 1931, 1957, Ligon 1927, Friedmann 1941, Aldrich and Duvall 1955, and Aldrich 1963). However, our study of the known specimens reveals that the New Mexico population was a distinct and undescribed subspecies, which diminished in numbers until presumably absorbed by an introduced population of *jamesi* in the early 1950s. Since then, the species has entirely died out in the state, with the last specific report having been in 1954 (Merrill 1967).

BACKGROUND

The Sharp-tailed Grouse was first attributed to New Mexico by the A.O.U. (1886, 1895), which included the state within the range of *T. p. campestris* (type locality: Illinois). At that time, only this and two other subspecies were recognized: *T. p. phasianellus* of boreal North America (type locality: Hudson Bay) and *T. p. columbianus* of southwestern Canada and the Great Basin region (type locality: Columbia River). The basis for New Mexico's inclusion in this grouse's range may have been three U.S. National Museum of Natural History specimens (USNM 11485–11487) taken at Fort Massachusetts. However, this site was actually in the San Luis Valley of central-southern Colorado (Figure 1), although administered under the U.S. Army's "Department of New Mexico" command (Frazer 1963).

Fort Massachusetts was active from 1852 until 1858, when replaced by Fort Garland (Frazer 1963). Only USNM 11486 from the Fort Massachusetts series remains at the U.S. National Museum of Natural History, number 11485 having been exchanged to the University of Kentucky in 1872 and 11487 to the Cleveland Museum of Natural History in 1877 (we did not attempt to relocate either of these specimens). The original label on no. 11486 bears the locality "Ft. Mass, NM" and gives the collector as "Capt. Bowman." A Captain Andrew W. Bowman was assigned to the Department of New Mexico in 1852 (Frazer 1963) and thus may have collected these grouse. Although aged and foxed, the USNM specimen appears to be *columbianus*—not *jamesi* as postulated by Giesen and Braun (1993). *Columbianus* has been documented elsewhere in southwestern Colorado near Pagosa Springs (Lincoln 1917), about 150 km southwest of Fort Massachusetts (Figure 1).

Interestingly, Ridgway (1884) did not cite New Mexico in describing *campestris*, which he attributed to Illinois, the Dakotas, Nebraska, and the eastern parts of Montana, Wyoming, and Colorado. However, he later expanded this taxon's range to include eastern New Mexico (Ridgway 1887). Subsequently, the A.O.U. (1910) omitted New Mexico from the range of this species, as did Lincoln (1917) in his description of *T. p. jamesi* (type locality: 3 miles [5 km] west of Castle Rock, Douglas Co., Colorado). A decade later, Ligon (1927) settled the issue of this grouse's occurrence in New Mexico by collecting three specimens on Johnson Mesa in Colfax County on 24 November 1926 (Figure 1).

Ligon (1927) ascribed his specimens to *T. p. columbianus*, on the basis of the identification of one (JSL 1185) sent to the Biological Survey in January 1927 (Ligon unpublished). This specimen is now in the University of California Museum of Vertebrate Zoology (MVZ 100267), having been received as part of the Allan Brooks collection. While indeed annotated as *columbianus*, none of the three labels indicates who made this determination. The other two Ligon specimens (JSL 1183 and 1184), originally mounted for the New Mexico Department of Game and Fish, were recently donated to the Museum of Southwestern Biology of the University of New Mexico (MSB 9984 and 9985). These specimens appear not to have been previously examined for a determination of their subspecific identity.

Ligon's (1927) allocation of the New Mexico grouse population to *T. p. columbianus* was subsequently followed by Bailey (1928), the A.O.U. (1931, 1957), Wetmore (1936), and Friedmann (1941). On the other hand, Aldrich and Duvall (1955), Aldrich (1963), Miller and Graul (1980), and Hoag and Braun (1990) treated it as *T. p. jamesi*. We suspect the latter was based on geographic probability rather than specimen examination, given that *jamesi* occurs east of the Rocky Mountains and *columbianus* to the west. Hoag and Braun (1990) revealed the existence of six additional New Mexico specimens of this species in the American Museum of Natural History (AMNH 353690–353695; formerly in the collection of Jonathan Dwight). These were taken by Austin Paul Smith on 5 and 8 October 1918 at Folsom, 7500 feet (2286 m), Union County (Figure 1). However, Folsom is at 1979 m (6492 feet), so we suspect that the specimens actually came from the nearby uplands. For example, about 17 km west of Folsom is the Sewell (Sewall?) Ranch, Colfax County, where native Sharp-tails persisted as late as 1952 (Merrill 1967). In fact, this ranch was the site of the only transplant of this species in the state: 21 North Dakota *T. p. jamesi* released by the New Mexico Department of Game and Fish on 11 March 1952 (Merrill 1967).

Our knowledge of the historic status of this grouse in New Mexico stems mainly from Ligon's 1926 account from Colfax County (Ligon 1927, 1961, Bailey 1928). He found about 75 birds in three flocks on Johnson Mesa and lesser numbers on Fisher Peak and Barillo mesas (2438–2743 m), all east and northeast of Raton (Figure 1). These mesas are part of an igneous extrusion reaching a maximum elevation of 2922 m in the high plains (1500–2000 m) of northeastern New Mexico and adjacent Colorado. The mesas support grasslands (and formerly grain fields and other croplands), with dense stands of oaks (*Quercus* spp.), conifers, and other

woody growth on steeper slopes. Ligon (1961) believed that waste grain was an important source of winter food for these grouse, while rank grasslands, shrublands, and wooded areas served other needs. Settlers, who had occupied this area by the 1860s, told Ligon of a longtime familiarity with this species, reporting that it was more common there prior to 1926.

We know of no historic records of Sharp-tailed Grouse in that part of Colorado immediately adjacent to northeastern New Mexico, i.e., Las Animas County (e.g., Lincoln 1917, Hoag and Braun 1990). Nonetheless, we believe the species undoubtedly occurred there, as Fisher Peak Mesa

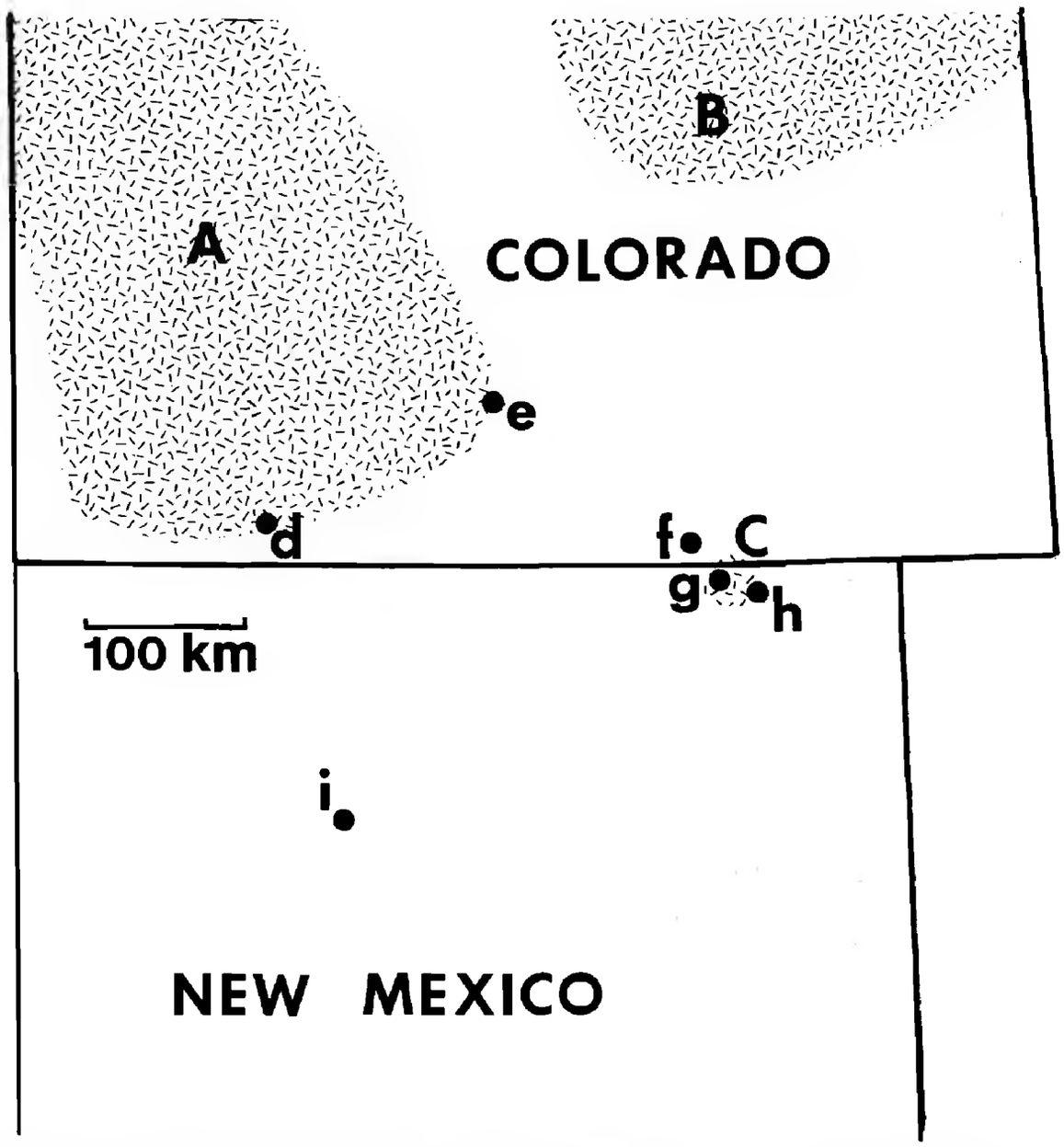

Figure 1. Historic distribution of the Sharp-tailed Grouse in New Mexico and southern Colorado (hatched areas): A, *Tympanuchus phasianellus columbianus* (Columbian subspecies); B, *T. p. jamesi* (plains subspecies); C, *T. p. hueyi* (New Mexico subspecies). Other localities: d, Pagosa Springs; e, Fort Massachusetts; f, Trinidad; g, Fisher Peak, Barillo, and Johnson mesas; h, Folsom; i, Jemez Springs.

occupies both states. Specimens of *T. p. jamesi* exist from eastern Colorado as far south as Elbert and Douglas counties (Figure 1), and this form is also reliably recorded from El Paso County (Hoag and Braun 1990). A gap of about 230 km appears to have separated *jamesi* from the grouse population to the south, with the most obvious divide being the Arkansas River. Some authors (e.g., Aldrich and Duvall 1955, Aldrich 1963) have postulated that Sharp-tailed Grouse historically occurred over much of southeastern Colorado. However, we question this, as well as unsubstantiated records from Oklahoma (Sutton 1967) and Texas (Oberholser 1974). Finally, even though this species undoubtedly once occurred in Kansas (e.g., Johnston 1965), the only reported specimen (Hoag and Braun 1990) is actually a Lesser Prairie Chicken (*T. pallidicinctus*)—fide David Willard (in litt.).

Other than the failed introduction by the New Mexico Department of Game and Fish in 1952, the only attempts to restore Sharp-tailed Grouse to the mesa country of New Mexico and Colorado have been by the Colorado Division of Wildlife (Hoag and Braun 1990, Braun et al. 1992). These involved transplants of *jamesi* east of Trinidad (north of Fisher Peak and Raton mesas) in Las Animas County from 1987 to 1989. These birds apparently failed to survive, and it was the prospect of more releases that led us to investigate the subspecific affinity of the historic grouse population of that area. Given that population is now extinct, its subspecific status may seem moot—even though it now proves to have been a distinct form. However, this is not only a matter of historic interest; it could help explain the failure of transplanted *jamesi* to survive in northeastern New Mexico and adjacent Colorado. There, the mosaic of grasslands, shrublands, woodlands, and forests constitutes habitats more associated with *columbianus*, rather than the shrubby grasslands generally occupied by *jamesi*. On the other hand, habitats in this mesa country may be so degraded that no Sharp-tailed Grouse of any stock is likely to prosper, at least until significant improvements are made.

Whatever its prospects for restoration in northeastern New Mexico and nearby Colorado, the Sharp-tailed Grouse was certainly once a viable member of the area's historic avifauna. Furthermore, there is evidence that the species was even more widespread in the not too distant past. For example, Wetmore (1936) reported the distal part of a tibiotarsus of this grouse from near Jemez Springs, Sandoval County, New Mexico (Figure 1), which is about 180 km south of the southernmost range of *T. p. columbianus* in Colorado and 255 km southwest of the northeastern New Mexico population. This specimen was found in a cave containing numerous avian remains, dating from about A.D. 1300 and associated with prehistoric man. Even earlier, during the Pleistocene epoch, forests and associated grouse habitats spread over wide areas of northern New Mexico and adjacent Colorado (e.g., Martin and Mehringer 1965). These habitats have retreated upslope over the last 12,000 years, contracting grouse populations and making them highly vulnerable to extirpation. Oscillations in climate (e.g., drought), man-induced changes in habitat, and other factors no doubt combined to eliminate most of these populations—of which that in northeastern New Mexico is a prime example.

SOUTHERN FORMS OF THE SHARP-TAILED GROUSE

The Sharp-tailed Grouse in the southwestern United States [California (formerly) to Colorado] is currently split into two subspecies, *T. p. jamesi* east of the Rockies and *T. p. columbianus* to the west (Figure 1). Lincoln (1917) also believed that *T. p. campestris* occurred in northeastern Colorado, but populations there and northward to Alberta and Saskatchewan are now considered *jamesi* (e.g., A.O.U. 1957, Aldrich 1963, Andrews and Righter 1992). *Jamesi* was originally described as differing from *columbianus* in having paler and grayer upperparts, including the rump and upper tail-coverts (Lincoln 1917). *Jamesi* was also said to have the pileum and occiput more narrowly edged (not banded) with rufous, the nape more rufous, to lack dark barring on the lower hind-neck, back, and wing coverts, to have the dark markings of the underparts more extensive and somewhat broader and paler (due to a median band of pale grayish-buff), the throat creamy white and immaculate or rarely with small dark spots (versus ochraceous and consistently spotted in *columbianus*), and the wings and tail longer, the tarsus shorter, and the bill stouter and more acutely curved (see Table 1). Friedmann (1941), who recognized these as valid taxa, mistakenly reversed the characters of their upperpart coloration, calling *columbianus* "paler...brownish grayish olive" or "grayish tawny olive," contrasted to "buckhorn brown" in *jamesi*. His measurements confirm Lincoln's (1917) claim that *jamesi* averages longer in wing and especially tail than *columbianus*. Contrary to Lincoln, Friedmann's measurements also show that the tarsus in *jamesi* averages longer and the bill stouter than in *columbianus*.

We examined a series of *T. p. columbianus* ($N = 50$) and *T. p. jamesi* ($N = 49$) and confirmed their separability on the basis of plumage, particularly upperpart coloration and throat pattern. In addition, we found the dark ventral markings of *jamesi* average broader and paler than those of *columbianus*. We also confirmed the findings of Hellmayr and Conover (1942) that only specimens in fresh fall plumage are suitable for color and

Table 1 Characteristics of Three Subspecies of Sharp-tailed Grouse in Southwestern North America

Character	*jamesi*	*hueyi*	*columbianus*
Hue of underparts	paler	medium	darker
Tone of upperparts	grayish brown	tawny brown	ruddy brown
Dorsal markings	less extensive	more extensive	more extensive
Throat coloration	brighter, whiter	duller, buffier	duller, buffier
Throat markings	none to very light	light to moderate	moderate to heavy
Width of ventral markings	broader	broader	narrower
Hue of ventral markings	paler	medium	darker
Wing length	longer	longer	shorter

pattern comparisons. Specimens taken later show various degrees of wear, soiling, and bleaching, which is not surprising given the environments occupied by these grouse. For example, the type and four paratypes of *jamesi* (Denver Museum of Natural History 4951–4953, 4979, and 4981), taken in February and March, are more worn and soiled than a large series from October and November. In particular, worn birds differ in having the pale tips of the feathers narrower, producing bolder and more contrasting patterning.

THE NEW MEXICO SHARP-TAILED GROUSE

We compared the nine known specimens of New Mexico Sharp-tailed Grouse with *T. p. columbianus* and *T. p. jamesi* and found they differ consistently and significantly from these taxa. Differences were particularly evident in the 1918 series taken by Smith in the Folsom area (see below). By contrast, the Ligon specimens (Johnson Mesa, 1926) are paler, no doubt faded by sustained exposure to light in the mounted birds and probably also in the study skin. Given these findings, we describe the New Mexico population as a new subspecies:

Tympanuchus phasianellus hueyi, new subspecies

Holotype. Male, AMNH 353691 (originally 49866 in the collection of Jonathan Dwight), collected on 8 October 1918 by Austin Paul Smith. The type locality is in the vicinity of Folsom, 7500 feet [2286 m], Union [perhaps actually Colfax] County, New Mexico

Diagnosis. Similar to *T. p. jamesi*, but the ground color of the upperparts is darker, less grayish brown; dark barring and mottling more extensive on the upper back, tertials, inner secondaries, crown, and nape; throat duller, buffier, and more extensively spotted with dark; dark markings on the breast, sides, and abdomen slightly darker. Differs from *T. p. columbianus* in having the upperparts paler, less ruddy brown; throat somewhat less heavily spotted with dark; dark markings of the underparts paler, somewhat broader, and averaging less extensive on abdomen (Table 1). Wing lengths of *hueyi* (mean 210.6 mm, range 206–214 in males, $N = 4$; mean 204.6, range 200.5–206 in females, $N = 5$) are similar to those given by Friedmann (1941) for *jamesi* (mean 210.3, range 199–223 in males, $N = 34$; mean 205.9, range 195–221 in females, $N = 52$) and thus average larger than those of *columbianus* (mean 202.4, range 194–210 in males, $N = 15$; mean 194.5, range 186–201 in females, $N = 12$). Tail lengths were not measurable in *hueyi*, as most specimens are in molt. We did not measure tarsus length, while bill measurements overlap those of *jamesi* and *columbianus*.

Distribution. Formerly occurred on Johnson, Barillo, and Fisher Peak mesas (2286-2922 m) in Colfax and Union (?) counties, New Mexico (e.g., Ligon 1927, Bailey 1928), and probably in adjacent Las Animas County, Colorado (Figure 1). This endemic subspecies is now presumed extinct, with the last native birds having been seen on the Sewell Ranch (west of Folsom) in Colfax County in 1952 (Merrill 1967).

Specimens examined. *T. p. columbianus* (50). British Columbia: Ducks—8; Okanagan—38; Washington: Yakima Co., Yakima—1; Oregon: Malheur Co., Ironside—1; Colorado: Costilla Co., Fort Massachusetts—1; Routt Co., Egeria Park—1. *T. p. jamesi* (49). Alberta: Calgary—1; Duffield—3; Morrin—1; Red Deer—5; Vermilion—4; Walsh—1; Saskatchewan: Maple Creek—1; Montana: Chouteau Co., Shonkin—1; Dawson Co., 5 mi. [8.3 km] E of Glendive—1; Roosevelt Co., Culbertson—1. South Dakota: Custer Co., locality?—2; Wyoming: Converse Co., Douglas—1; Sheridan Co., Bear Lodge—1. Colorado: Adams Co., Bennett—2, locality?—2; Douglas Co., Castle Rock—7, locality?—3; county?, Denver—1; Weld Co., Masters—1; Wray Co., locality?—2; Yuma Co., locality?—1; Nebraska: Blaine (or Thomas) Co., Halsey—1; Cherry Co., locality?—1; Morrill Co., Bridgeport—4; Thomas Co., locality?—1. *T. p. hueyi* (9). New Mexico: Union [Colfax?] Co., Folsom—6; Colfax Co., Johnson Mesa, 20 mi. [32 km] E of Raton—3.

Remarks. Although vernacular names are no longer widely applied to subspecies of North American birds, their retention for game species is useful to wildlife managers and others. Therefore, we recommend that *hueyi* be known as the New Mexico Sharp-tailed Grouse. The extinction of this subspecies probably stemmed mainly from the effects of human settlement and occupancy of its range in the late nineteenth and first half of the twentieth century. Although the clearing of land for farming and overgrazing (exacerbated by periodic drought) certainly contributed to this process (Ligon 1927, 1961, Merrill 1967), extinction probably eventuated from a combination of factors. Ironically, grain-farming and the ancillary growth of weeds may have initially benefited this population, whereas later conversion of farmland to pastures and grazing probably sounded its death knell. Thus, despite having survived the trauma of the post-Pleistocene era, the New Mexico Sharp-tailed Grouse must now be added to the list of extinct North American taxa—which is a loss to us all.

Etymology. We name this extinct subspecies in honor of William S. Huey, former director of the New Mexico Department of Game and Fish, in recognition of his significant role in conserving wildlife and its habitats in New Mexico, North America, and around the world.

SUMMARY

An extinct subspecies of the Sharp-tailed Grouse, *Tympanuchus phasianellus hueyi*, is described from northeastern New Mexico, where it occurred on Johnson, Barillo, and Fisher Peak mesas in Colfax (and perhaps Union) County and probably adjacent Colorado (Las Animas County). It differed from *T. p. jamesi* mainly in being darker, less grayish, and more heavily marked and from *columbianus* in being paler, less ruddy, more lightly marked, and longer-winged. *Hueyi* persisted until 1952, when four birds were reported on the Sewell Ranch west of Folsom, New Mexico. These were presumably soon absorbed by a transplant there of 21 plains Sharp-tailed Grouse (*T. p. jamesi*), and no birds of either subspecies were reported in this area or elsewhere in northeastern New Mexico after 1954.

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SHOREBIRDS OF HUMBOLDT BAY, CALIFORNIA: ABUNDANCE ESTIMATES AND CONSERVATION IMPLICATIONS

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Long stretches of the Pacific coast of North America are rocky or sandy, punctuated by only a few large bays and river estuaries. During migration and winter most shorebirds (suborder Charadrii) use these bays and estuaries (Senner and Howe 1984, Page et al. 1992), which also are the center of human activities that place shorebird populations at risk (Myers et al. 1987). Senner and Howe (1984) identified Humboldt Bay, California, as one of 58 important North American sites for shorebirds, estimating largely from the work of Gerstenberg (1972) that over 100,000 shorebirds of approximately 30 species use Humboldt Bay as a wintering area or migration stopover site. Additionally, Page et al. (1991) emphasized the area's importance to the coastal population of the Snowy Plover (see Table 1 for scientific names), recently listed as threatened under the Federal Endangered Species Act (Miller 1993).

As a foundation for future conservation efforts directed at shorebirds of Humboldt Bay and the Pacific flyway, this paper reports results of the first three years of continuing shorebird surveys beginning in fall 1990. Here, I examine seasonal variation in shorebird abundance, comparing recent results with other studies (Gerstenberg 1972, Page et al. 1992) in an attempt to understand the current and historical importance of Humboldt Bay to shorebirds of the Pacific flyway. Finally, I discuss these findings relative to potential threats facing shorebird populations.

STUDY AREA

Humboldt Bay, the largest bay between San Francisco Bay, California (420 km south), and Coos Bay, Oregon (350 km north), covers 90 km^2 at high tide, divided into three sections (Costa and Stork 1984). A large northern portion, Arcata Bay, is separated from a smaller southern embayment, South Bay, by a narrow channel and bay known as Entrance Bay, which opens to the ocean. At low water, approximately 70% of Humboldt Bay consists of mud and sand flats, dissected by a complex system of channels. Only Entrance Bay remains approximately constant in surface area over a tidal cycle (Costa and Stork 1984).

Nearly a century ago, humans diked the bay and converted salt marsh and tidal flats to agricultural lands, principally pastures (Hoff 1979). Most of this pastureland is situated north and east of Arcata Bay, but some lies adjacent to South Bay. To the west and separated from the bay by two large spits is approximately 25 km of sandy ocean beach, extending north to the mouth of Little River and south beyond the mouth of the Eel River to Centerville Beach. Estuaries at the mouths of these rivers also provide habitat for shorebirds. Rocky intertidal habitat occurs sparingly at the jetties at Humboldt Bay's entrance and in greater amounts north in the vicinity of

Trinidad. See Gerstenberg (1972), Hoff (1979), and Nelson (1989) for a complete description of Humboldt Bay habitats.

METHODS

Beginning in fall 1989, in collaboration with E. T. Nelson and R. J. Cooper, I began coordinating shorebird surveys at Humboldt Bay as part of the Pacific Flyway Project initiated by Point Reyes Bird Observatory (see Page et al. 1992). Surveying shorebirds at Humboldt Bay is easier than at many places because many enthusiastic and experienced birders are easily organized to survey shorebirds at sites readily accessible by road, the configuration of the bay allows observers to get close to birds just prior to inundation of tidal flats by rising tides, and the timing of tidal inundation varies little over the bay, the difference between the extremes of Arcata Bay and South Bay being approximately 45 minutes, enabling synchronous counting of birds under similar conditions.

Data reported here are from surveys at sites within and adjacent to the bay, established in an attempt to balance the objectives of maximizing coverage of habitats while minimizing possibilities of observers counting the same birds. Four surveys were done each of the three years, once in fall (25 August–8 September), once in early winter (10–18 November), once in late winter (17–23 February), and once in spring (25–28 April). I chose these survey dates to coincide with fall and spring migration and to bracket the winter period in which movements of birds declined.

For each survey, I coordinated multiple observers who counted birds from 22 to 37 fixed locations (Table 1) using binoculars and spotting scopes. At each location observers conducted four synchronized counts of shorebirds at half-hour intervals. At fewer sites (n = 8), participants surveyed shorebirds either by walking beaches for one hour and then reversing direction and conducting a second count or by driving through agricultural lands along predetermined routes (n = 3). These sites were not surveyed when participants were few. Surveys of shorebirds using beaches and agricultural land coincided with surveys at locations around the bay, but I collated the data with the first and third counts at fixed sites. All surveys were scheduled during rising tides so that the advancing water pushed birds toward observers. See Colwell and Cooper (1993) for details and discussion of survey methods.

I collated observations from each survey site using the following variables: date, start time of survey (half-hour interval), survey site, species of shorebird, and number of individuals observed. Sometimes the distance at which observers viewed birds or observer inexperience made identification of species difficult. In these cases, observers classified birds into one of three broader categories: *large shorebirds* (i.e., Whimbrel, Marbled Godwit, Long-billed Curlew, and Willet), *small calidridine sandpipers* (i.e., Dunlin, Western Sandpiper, and Least Sandpiper), and *yellowlegs*. Additionally, owing to difficulty in identifying species of dowitchers, I combined all information for this genus.

For each survey date, I estimated the abundance of each species and all shorebirds in the following manner. First, I tallied each species' abundance

during each half-hour survey period by summing counts across survey sites. Next, I estimated each species' abundance using the highest count from the four survey periods. Finally, I estimated the total number of shorebirds as the sum of species' maximum counts regardless of survey period.

RESULTS

Observers recorded 32 shorebird species during the 12 surveys and 19–24 species during any single survey (Table 1). Although average species richness varied little from season to season (mean = 22 for each season), species composition changed slightly owing to the presence or absence of uncommon species (e.g., Black-necked Stilt, Buff-breasted Sandpiper) or arrival and departure of migratory species (e.g., Dunlin).

Estimates of total shorebird abundance varied widely from survey to survey (Table 1). Maximum (83,647) and minimum (17,751) counts occurred in April 1991 and in February 1993, respectively. The abundance of individual species varied across five orders of magnitude (Table 1). Three sandpipers (*Calidris* spp.) accounted for 53–87% of all shorebirds. Thus changes in total shorebird abundance arose largely from changes in sandpiper abundance. Each year, shorebird abundance increased from summer to early winter, declined during the winter, and either increased or decreased during spring.

DISCUSSION

Importance of Humboldt Bay

Estimates of shorebird abundance (Table 1) suggest that the Humboldt Bay area supports 19–24 species and 10^4–10^5 shorebirds at any one time during migration and winter. Comparisons with earlier shorebird studies at Humboldt Bay and elsewhere along the Pacific coast (Page et al. 1992) are difficult owing to differences in area surveyed and variation in survey methods. Despite these differences, however, some comparisons are warranted.

Pacific Coast Comparisons

Compared with other Pacific coast sites (see Boland 1988, Page et al. 1992), Humboldt Bay supports a rich shorebird community. Forty-six species have been recorded, including approximately 30 that may be encountered regularly (Gerstenberg 1972, Harris 1991). Analyses of Christmas Bird Count (CBC; excluding Humboldt Bay) data indicate that winter shorebird diversity along the Pacific coast is inversely correlated with latitude, a pattern more closely associated with declining (northward) diversity and availability of prey than habitat diversity (Boland 1988). Data reported here suggest that winter shorebird diversity at Humboldt Bay surpasses that reported for other sites within approximately 5° latitude north and south on the Pacific coast. This observation is supported by eight years (1984–91) of CBC data (not analyzed by Boland 1988) from the two counts conducted within the Humboldt Bay area: species richness for

Table 1 Maximum Counts of Shorebirds at Humboldt Bay, September 1990–April 1993

	Season												
	Fall			Early Winter			Late Winter			Spring			
Species	8 Sep 1990	25 Aug 1991	29 Aug 1992	18 Nov 1990	10 Nov 1991	15 Nov 1992	17 Feb 1991	23 Feb 1992	21 Feb 1993	28 Apr 1991	25 Apr 1992	25 Apr 1993	Order-of-Magnitude Estimate[a]
Black-bellied Plover *Pluvialis squatarola*	667	972	807	2612	499	762	1475	766	1499	174	118	293	10^3-10^4
Pacific Golden Plover *Pluvialis fulva*	2	—	—	—	2	—	—	—	—	—	—	—	$<10^1$
Snowy Plover *Charadrius alexandrinus*	—	19	23	10	24	32	15	—	11	1	—	19	10^1-10^2
Semipalmated Plover *Charadrius semipalmatus*	32	411	215	469	548	85	1495	151	42	255	73	500	10^2-10^3
Killdeer *Charadrius vociferus*	20	1	27	315	24	10	478	100	126	3	3	9	10^2-10^3
Black Oystercatcher *Haematopus bachmani*	—	—	3	1	6	18	1	—	22	5	—	19	10^1-10^2
Black-necked Stilt *Himantopus mexicanus*	—	—	—	—	—	—	1	—	—	—	—	—	$<10^1$
American Avocet *Recurvirostra americana*	474	94	128	860	1023	885	1000	802	847	73	74	50	10^2-10^3
Greater Yellowlegs *Tringa melanoleuca*	71	42	16	12	17	16	33	7	10	40	7	31	10^1-10^2
Lesser Yellowlegs *Tringa flavipes*	14	2	3	—	3	1	2	—	—	1	—	4	$<10^1$
Yellowlegs spp. *Tringa* spp.	68	4	9	—	17	6	25	29	74	9	1	11	—
Willet *Catoptrophorus semipalmatus*	1648	801	750	3217	2715	972	2249	1155	352	348	69	64	10^3-10^4
Wandering Tattler *Heteroscelus incanus*	1	—	1	—	1	—	1	1	1	15	9	5	$<10^1$
Spotted Sandpiper *Actitis macularia*	2	1	9	2	2	2	—	—	1	4	1	1	$<10^1$
Whimbrel *Numenius phaeopus*	26	61	53	4	3	4	3	9	3	223	146	146	10^2-10^3
Long-billed Curlew *Numenius americanus*	173	85	137	286	133	66	94	90	352	33	399	14	10^2-10^3
Marbled Godwit *Limosa fedoa*	6955	2176	3524	6331	6840	3982	7865	5129	2332	6900	1113	350	10^3-10^4

Large sandpipers[b]	1631	1877	819	2000	—	1352	—	292	650	2590	17	2375	—
Ruddy Turnstone *Arenaria interpres*	—	8	1	2	75	1	—	—	9	2	2	9	10^1-10^2
Black Turnstone *Arenaria melanocephala*	3	—	32	33	57	35	93	146	35	75	15	42	10^1-10^2
Surfbird *Aphriza virgata*	—	—	30	—	—	25	22	58	39	17	—	23	10^1-10^2
Buff-breasted Sandpiper *Tryngites subruficollis*	1	1	—	—	—	—	—	—	—	—	—	—	$<10^1$
Red Knot *Calidris canutus*	8	7	5	38	10	5	1	30	2	7	55	4	10^1-10^2
Sanderling *Calidris alba*	176	167	670	1120	632	693	351	726	133	598	9	725	10^2-10^3
Baird's Sandpiper *Calidris bairdii*	2	2	—	—	—	—	—	—	—	—	—	—	$<10^1$
Western Sandpiper *Calidris mauri*	6295	2382	7774	7420	6537	3500	6100	913	697	7380	9732	2422	10^3-10^4
Least Sandpiper *Calidris minutilla*	142	540	783	3058	3772	228	2390	796	140	1047	273	169	10^3-10^4
Rock Sandpiper *Calidris ptilocnemis*	—	—	—	—	—	—	—	2	—	—	—	—	$<10^1$
Dunlin *Calidris alpina*	25	—	—	22960	12338	4146	23246	5393	3122	23303	4309	3629	10^4-10^5
Small sandpipers *Calidris* spp.	7873	8724	20105	15214	21233	20149	6070	8020	6745	37565	3652	9269	—
Dowitchers *Limnodromus* spp.	736	656	451	471	1307	278	1766	375	495	2979	930	128	10^2-10^3
Common Snipe *Gallinago gallinago*	—	—	—	19	—	9	1	1	12	—	—	2	$<10^1$
Red-necked Phalarope *Phalaropus lobatus*	5	—	3	—	—	—	—	—	—	—	—	—	$<10^1$
Red Phalarope *Phalaropus fulicaria*	—	—	—	—	1	—	—	—	—	—	—	—	$<10^1$
Species richness[c]	23	20	23	21	24	23	23	21	23	23	19	24	
Total shorebirds	27050	19033	36377	66454	57802	37261	54772	24981	17751	83647	20634	20299	10^4-10^5
Number of observers	50	24	44	57	50	39	62	47	46	47	35	41	
Number of sites surveyed	32	22	29	33	31	27	37	32	30	30	26	27	

[a]Spans a species' single maximum count based on all seasons.
[b]Includes Marbled Godwit, Long-billed Curlew, Willet, and Whimbrel.
[c]Total includes only one dowitcher.

Arcata and Centerville CBCs averages 23 and 24, respectively (S. W. Harris pers. comm.). Therefore, inclusion of data from Humboldt Bay in Boland's (1988) comparison likely would have yielded an even more precipitous decline in species richness just north of Humboldt Bay. Data provided here, as well as elsewhere (Boland 1988, Page et al. 1992), indicate that this latitudinal pattern arises because Humboldt Bay lies at the northern limit of the wintering range of several species (e.g., American Avocet, Marbled Godwit, and perhaps Red Knot, Long-billed Curlew, and Short-billed Dowitcher).

Results of Pacific Flyway Project surveys at other Pacific coast sites (Page et al. 1992) suggest that Humboldt Bay's importance (based on order-of-magnitude estimates of abundance) to shorebirds varies seasonally. During winter, Humboldt Bay ranks second to San Francisco Bay ($>10^5$ birds) in shorebird abundance. During fall, Humboldt Bay is also among the most important sites, whereas during spring, it does not appear to be as heavily used as other estuaries and bays (e.g., Columbia River estuary, Grays Harbor, Fraser River delta).

Humboldt Bay Comparisons

During the three years of this study, the largest number of shorebirds (83,647) occurred during spring migration (April 1991) when birds move through the area rapidly. This is less than Gerstenberg's (in Senner and Howe 1984) migration-period estimate of more than 100,000 birds. The latter estimate was based on an extrapolation of bird abundance in study plots to the entire area of the bay and supplemented by aerial surveys (R. Gerstenberg pers. comm.). Winter estimates of shorebird abundance probably are influenced less by bird movements than those during migration. However, declines in shorebird abundance between November and February suggest that local movements take place even at this time of year. Gerstenberg (1972) estimated a maximum of 50,000 birds in single winter (November 1969) roosts, exceeding most bay-wide estimates from this study (Table 1). This comparison is especially interesting because Gerstenberg's largest roosts were at sites where the maximum count during this study approximated 10,000 birds. Even if Gerstenberg's estimates of flock size erred by 50%, his *single-site* total falls within this study's range of winter estimates for the *entire bay* (Table 1). Thus numbers of shorebirds using the Humboldt Bay area apparently have declined in the last 25 years. The most noteworthy exception to this pattern is the American Avocet, which has experienced a population increase during the past 25 years (Harris 1991).

Shorebird Conservation at Humboldt Bay

Shorebird conservationists have emphasized estimating numbers of birds using regional flyways or individual sites, with the aim of understanding population trends (e.g., Howe et al. 1989) or designating critical habitats (e.g., Page et al. 1992). Shorebirds concentrate in large numbers during the nonbreeding season at a limited number of wetlands. It is at these locations that shorebird populations are most vulnerable to a variety of anthropo-

genic factors, and these wetland habitats remain the weakest links in conservation efforts directed at migratory species (Myers et al. 1987). Therefore, conservation of shorebirds may necessitate a broader perspective than for other birds. Nevertheless, an understanding of local conservation issues is important to global efforts.

Shorebird distribution and abundance in the Humboldt Bay area presumably has been influenced by habitat alteration and degradation, as well as human disturbance. Humboldt Bay has changed dramatically over the past century by diking, filling, dredging, and aquaculture, which have altered natural ecosystems. By 1980, the original wetlands of Humboldt Bay had been reduced 30% (Shapiro and Associates 1980). Alarmingly, however, less than 3% of approximately 6300 ha of tidelands and channels in Humboldt Bay are currently protected by state and federal agencies (K. Foerster pers. comm.). Conversion of intertidal habitat to agricultural lands probably influenced local shorebird distribution. Currently, however, pasturelands are used regularly by shorebirds, especially during winter when rains and short vegetation enhance foraging opportunities (Hoff 1979).

In Arcata Bay, oyster (*Crassostrea virginica*) culture (oysters grown on intertidal substrates) is an important local industry that alters a large proportion of intertidal habitat. Some potential effects of oyster harvest include alteration of intertidal flats, destruction of eelgrass (*Zostera marina*) beds, and changes in invertebrate populations owing to harvest techniques (Waddell 1964). Furthermore, indiscriminate dumping of shells and human disturbance during harvest may affect birds. These impacts are probably greatest for waterfowl, especially the Brant (*Branta bernicla*), which forages on eelgrass (Waddell 1964), but impacts on invertebrates probably influence shorebirds by altering the quality of foraging areas.

Elsewhere around Humboldt Bay, human disturbance is probably greatest along the 25 km of beaches where recreation is concentrated and Snowy Plovers breed (Page et al. 1991). Nelson (1989) suggested that disturbance along the south spit of Humboldt Bay had displaced plovers that had nested there in the past, and M. Fisher (pers. comm.) observed a nest there destroyed by vehicles in 1993.

Nonbreeding shorebirds also may be influenced by human activities on beaches. Large numbers roost on beaches at high tides, when they may be particularly susceptible to human disturbance. Nelson (1989) reported that people disturbed roosting shorebirds during 20% of his surveys. Although human activity on the beaches adjacent to Humboldt Bay is high (over 34,000 recreational users estimated between 1 January and 31 August 1988 for Samoa Peninsula; Gearheart 1988), its effects are unknown and warrant study. So far, however, recreational use of Humboldt Bay beaches does not approach the high levels associated with the changes in shorebird distribution observed along the Atlantic coast of North America (Pfister et al. 1992).

SUMMARY

I examined seasonal variation in shorebird abundance at Humboldt Bay, California, on the basis of 12 surveys conducted over 3 years by multiple

observers. Relative to other Pacific coast sites (see Boland 1988, Page et al. 1992), the Humboldt Bay shorebird community is diverse (approximately 45 species overall and 19–24 species during any one season) and abundant (10^4–10^5 shorebirds, but numbers vary widely from season to season and year to year). Comparison with earlier studies of shorebirds at Humboldt Bay suggests that overall shorebird abundance has declined. During winter, this area hosts the following proportions of Pacific flyway populations (see Page and Gill 1994): Marbled Godwit, 5–8%; Dunlin, 4–5%; Willet, 3–4%; American Avocet, 1%. Conservatively, these numbers suggest that Humboldt Bay qualifies as a "regional site" (>20,000 shorebirds or at least 5% of a flyway population) under the Western Hemisphere Shorebird Reserve Network (Hunter et al. 1991). Estimates during migration periods, however, suggest this area may merit classification as an "international site" (100,000 shorebirds or at least 15% of a flyway population). Further understanding of the importance of Humboldt Bay to shorebirds requires more precise estimates of shorebird abundance based on improved survey techniques and greater knowledge of species-specific turnover rates.

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OCCURRENCE OF SNOWY AND COLLARED PLOVERS IN THE INTERIOR OF MEXICO

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The A.O.U. (1983) noted breeding by Snowy Plovers (*Charadrius alexandrinus*) in the interior of North America south to southern Arizona and southern New Mexico; all records for Mexico (breeding and winter) were coastal. The Collared Plover (*Charadrius collaris*) is described as resident from Sinaloa and Veracruz south through Middle America, primarily in coastal areas (A.O.U. 1983, Friedmann et al. 1950). We detail here several recent records (since 1982) of both of these plovers from the interior of northern and central Mexico. Our hope is to make observers aware of the potential occurrence of Snowy and Collared plovers at sites in the interior of Mexico. Figure 1 shows sites mentioned for Snowy Plovers in the following accounts.

SNOWY PLOVER

Coahuila

At Presa El Tulillo (25°40' N, 101°24' W; elevation 1100 m), a reservoir 50 km west-northwest of Saltillo, we noted four to five basic-plumaged Snowy Plovers along the south shore on 27 November 1986. Aldegundo Garza de Leon (pers. comm.), an ornithologist resident in Saltillo, collected two Snowy Plovers (numbers 778 and 779 in his collection) at El Tulillo on 21 March 1982, but has found no evidence that the species nests at this site.

Zacatecas

At Presa Acecatecana (22°44' N, 102°33' W; 2150 m), a large reservoir south of the bypass on the south side of the city of Zacatecas, we found 11 or 12 alternate-plumaged Snowy Plovers on 27 June 1991 in an extensive dry muddy area along the reservoir's northeast corner, near the dam. The birds included three or four apparent pairs, which gave the upslurred *chuweep* and low *perrt* calls typical of nesting birds. We saw one bird apparently trying to lead another into a small area where the first bird would sit down as if in a nest scrape; however, we found no eggs. Howell visited this reservoir on 4 January 1984 and 12 April 1987 but saw no Snowy Plovers on those dates.

To our knowledge, the only previous report from Zacatecas is of three seen, and an adult female collected, at a shallow lake 8 km east of Noria de los Angeles in the southeast of the state, 3 August 1959 (Webster 1968); this site is 25 km due south of Salinas de Hidalgo, San Luis Potosí (see following).

San Luis Potosí

On 28 June 1991, immediately west of the town of Salinas de Hidalgo, in western San Luis Potosí (22°38' N, 101°45' W; 2100 m), we saw six to eight pairs of Snowy Plovers, including an adult with two small chicks, at the largest lagoon south of Highway 49. We have found no previous records from San Luis Potosí.

Guanajuato

At the small reservoir southwest of Highway 111, 5 km east of Dolores Hidalgo (21°08' N, 100°53' W; 1900 m), P. Pyle and Howell saw a single basic-plumaged Snowy Plover on 6 January 1984. We have found no other records of the species from Guanajuato.

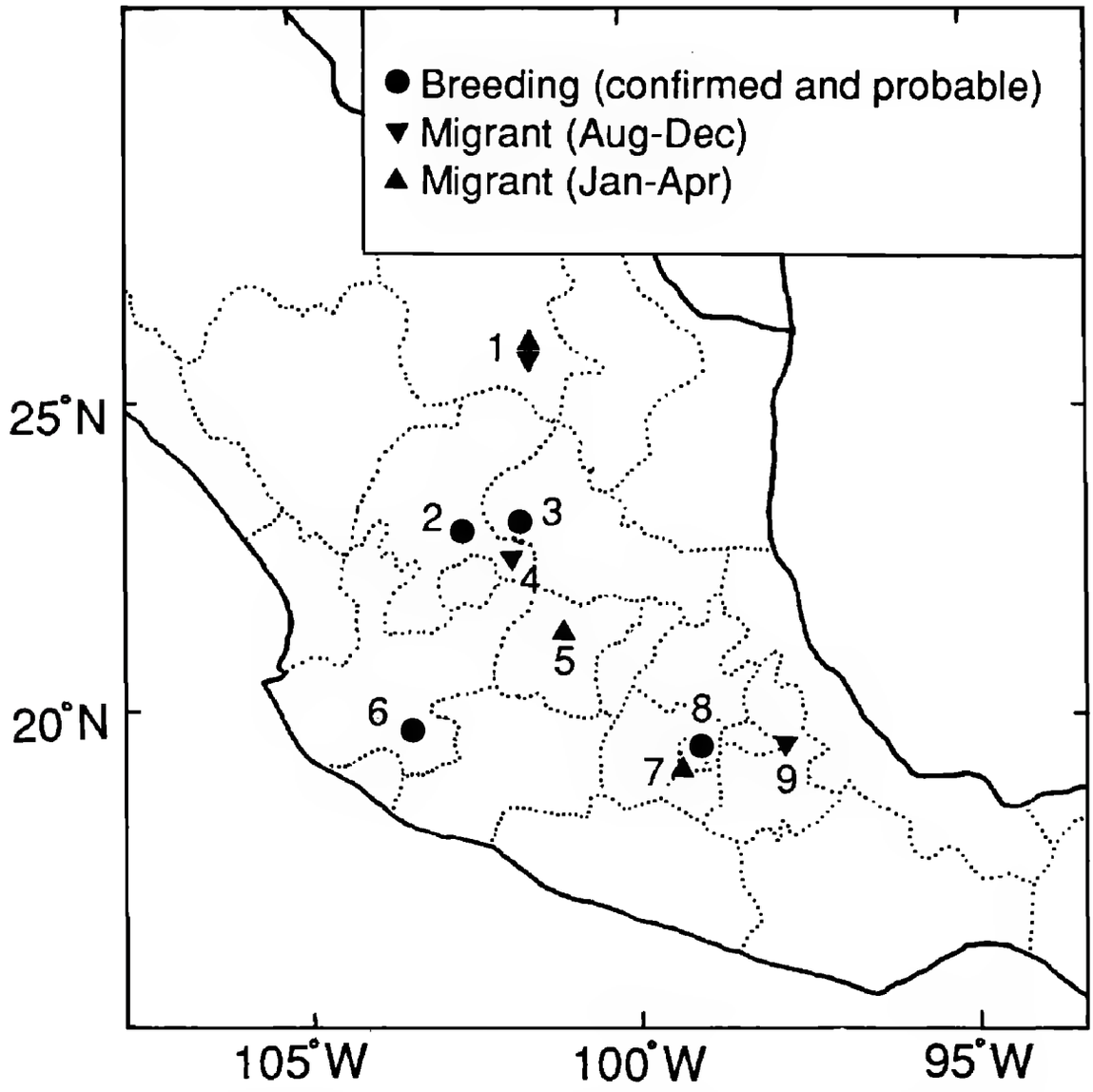

Figure 1. Central Mexico, showing sites in the interior where Snowy Plovers have been recorded. 1, Presa El Tulillo, Coahuila; 2, Presa Acecatecana, Zacatecas; 3, Salinas de Hidalgo, San Luis Potosí; 4, Noria de los Angeles, Zacatecas; 5, Dolores Hidalgo, Guanajuato; 6, Atoyac, Jalisco; 7, San Gregorio/Tlahuac, Distrito Federal; 8, Lago Texcoco, México; 9, Laguna Totolcingo, Puebla.

Jalisco

On 9 March 1992, Howell found six alternate-plumaged birds at the permanent lake immediately northeast of Highway 54D at kilometer post 33 (20°08' N, 103°33' W; 1500 m), near Atoyac. The birds included one apparent pair, and Howell heard a few *chuweep* calls being given. At the much larger shallow seasonal lake east of highway 54D between kilometer posts 35 and 40, Howell noted at least 100 Snowy Plovers on 27 February 1993; none showed any indications of nesting. We know of no previous records from Jalisco.

Puebla

Laguna Totolcingo, a vast shallow lake, straddles the eastern border of Tlaxcala with the state of Puebla (19°20' N, 97°62' W; 2200 m). On 12 December 1986 we saw 100+ Snowy Plovers on the extensive salt flats bordering the lake north of Highway 136, all apparently in the state of Puebla. At least 40% of the birds were in full alternate plumage, 20% or more were in basic plumage, and 30% of the birds were juveniles, some in very fresh plumage; the remainder were too distant for their plumage to be assessed accurately. We have found no other records from Puebla. Howell visited this lake on 21 January 1984 but saw no Snowy Plovers. The large expanse of the lake and salt flats, however, combined with fluctuating water levels, means that at any given time much of the area may be generally inaccessible to observers and/or unsuitable for plovers.

México/Distrito Federal

The only records of the Snowy Plover from the Distrito Federal are of single alternate-plumaged birds seen at the relatively heavily birded marshes on the south side of Mexico City (19°16' N, 99°08' W; 2200 m), at San Gregorio Atlapulco on 22 April 1985 (Wilson and Ceballos-L. 1986), and at Tlahuac on 22 April 1992 (Howell and R. G. Wilson). Snowy Plovers occur in summer and may nest at Lago Texcoco (19°30' N, 99°02' W) on the Mexico/D.F. border (Wilson and Ceballos-L. 1986, R. G. Wilson pers. comm.).

COLLARED PLOVER

Collared Plovers are resident locally along rivers in the lowlands on both coastal slopes of Mexico, and we have seen them up to 250 km from the coast (e.g., at Yaxchilan, Chiapas). Such records, however, are all in the tropical lowlands (below 500 m elevation). Records that fall outside this pattern are listed below.

Jalisco

At the extensive marshes and lakes beside Highway 54D north of Sayula (20°02' N, 103°34' W; 1500 m), we saw five Collared Plovers, including two apparent pairs, on 31 March 1988, and Howell noted four birds on 10 March 1989 and four on 27 February 1993.

Tlaxcala

On 21 January 1984, P. Pyle and Howell found a Collared Plover at a small pool in the short-grass plains bordering Laguna Totolcingo, in Tlaxcala. They realized the rarity of such an occurrence and carefully noted the bird's elegant, slender build and slender, all-black bill. Other features noted were the bold, clean-cut white forehead patch, the complete, narrow black chest band, a rufous wash to the sides of the head, lack of a white hindcollar, and the slender, pale flesh-colored legs. This is the only record of Collared Plover we are aware of from the Mexican plateau.

Morelos

At Laguna El Rodeo (18°46' N, 99°20' W; 1000 m), a small natural lake 15 km south-southwest of Cuernavaca, R. G. Wilson (pers. comm.) recorded up to four Collared Plovers in the winters of 1983/1984 (also seen by Howell and P. Pyle), 1986/1987, and 1989/1990, with extreme dates of 8 October and 15 March. We saw none at El Rodeo on 20 May 1990, and R. G. Wilson (pers. comm.) has seen none there during several visits from April to September.

Guerrero

At Laguna de Tuxpan (18°22' N, 99°30' W; 750 m), a large lake 2 km east of Iguala, we and R. G. Wilson saw three to five Collared Plovers along the south shore on 16 December 1986. We saw none there on 20 May 1990 or 2 June 1986.

DISCUSSION

These observations indicate that Snowy Plovers breed locally in summer at lakes and reservoirs on the Mexican plateau. While our only certain proof of nesting was the chicks in San Luis Potosí, the calls and behavior of the birds in Jalisco and Zacatecas strongly suggest that they also were nesting. The species also may nest at Lago Texcoco, state of México. By December, many wintering Snowy Plovers have attained alternate plumage (G. W. Page pers. comm.), which may explain our observation at Laguna Totolcingo. The number of fresh-plumaged juveniles there, however, may also suggest late summer nesting by Snowy Plovers at or near the site.

Nonbreeding Snowy Plovers, possibly from the interior of North America, occur as winter migrants to the Mexican plateau, with specific records between November and March. The two April records, both from the Distrito Federal, may represent migrants headed for nesting sites in Mexico, since most Snowy Plovers nesting in the interior and on the Pacific coast of the U.S. have by then arrived at breeding areas (G. W. Page pers. comm.).

Clearly, more field work is needed to determine the nesting season, distribution, and breeding and winter abundance of Snowy Plovers in the interior of Mexico; for example, numerous large shallow lakes on the Mexican plateau in the states of Chihuahua and Durango have never been surveyed for Snowy Plovers. The dearth of records for both Snowy and Collared plovers from the interior of Mexico prior to the 1980s probably

reflects a lack of observer coverage rather than range expansion by either species.

The Collared Plover appears to be a winter visitor (October to March) to lakes in the Rio Balsas drainage of interior southwest Mexico and a winter vagrant to the central highlands (the January record from Tlaxcala). There is no evidence of breeding by Collared Plovers at the lakes in Guerrero and Morelos. Although Widrig (1983) reported Collared Plovers nesting in December in coastal Nayarit, other known nesting dates from southwest coastal and interior Mexico are in spring: on 11 April 1988 at Puente Mexcalhuacan, Michoacan, we found an agitated pair of Collared Plovers behaving as if they had chicks nearby; on 20 May 1990 (when we saw no Collared Plovers at either El Rodeo or Tuxpan) we found a nest with four eggs on the beach at the eastern end of Laguna Mitla, Guerrero; Binford (1989) saw an adult with three chicks in coastal Oaxaca, 19 April 1964; Amadon and Eckelberry (1955) saw adults with chicks at two sites in interior southeastern Veracruz and western Chiapas in mid May 1952. Further work is needed to determine this species' status in southeastern Jalisco.

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BREEDING WATERBIRDS OF LA PAZ BAY, BAJA CALIFORNIA SUR, MEXICO

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La Paz Bay, Baja California Sur, México, is located in the transition zone between two mayor biogeographic areas (based on fish and invertebrate distribution), the California region and the Cortez province (Briggs 1974 in Anderson 1983). These areas are characterized by patterns of climatic and latitudinal zonation that influence seabirds' distribution and breeding ranges (Anderson 1983), so data on species nesting in and near this transition zone may help clarify the factors governing these distributions. Within the bay there are nine islands and extensive mangroves, constituting the main sites used by breeding waterbirds (Figure 1).

This part of the Baja California peninsula is characterized by a semidesert climate with a mean annual temperature of 23° C (García and Mosiño 1969) and an average annual precipitation of <200 mm (Jiménez 1989). Vegetation on the islands is sparse, typified by chollas (*Opuntia* spp.), sour pitahaya (*Machaerocereus gummossus*), old-man cactus (*Lophocereus schottii*), saltbush (*Atriplex* spp.), box-thorn (*Lycium* spp.), Adam's tree (*Fouquieria diguetti*), and cardón (*Pachycereus pringlei*) (Roberts 1989).

Estuaries, surrounded by mangrove forests, cover about 25% of the coastline of La Paz Bay, mainly at its southern end (Llinas et al. 1989). Mangroves occur also on Espíritu Santo Island. There are three species of mangroves in this area: the Red (*Rizophora mangle*), the Black (*Avicennia germinans*), and, in small numbers, the White (*Laguncularia racemosa*).

The status and conservation of breeding seabirds in the Gulf of California have been reviewed by Everett and Anderson (1991) and Velarde and Anderson (1993). The waterbirds of La Paz Bay have been studied by many researchers (Mendoza 1983, Llinas 1986, Galindo 1987, Palacios 1988, Jiménez 1989, Llinas et al. 1989, Llinas and Galindo 1990, Carmona and Zárate 1992, Carmona 1993, Fernández 1993), but much of their information is unpublished. Here we compile and add to these records. This report is based on 14 years (1979–1993) of field work by the Avian Laboratory of the Universidad Autónoma de Baja California Sur, La Paz. We censused birds along the coasts of the bay monthly from 1980 to 1985. The last three years our censuses were performed twice every month during the nesting season (February–July) and extended to the west coast of Espíritu Santo Island and the whole periphery of the small islands El Gallo, La Gallina, La Lobera, La Ballena, La Gaviota, El Merito and San Rafaelito (Figure 1), where most waterbirds nest.

SPECIES ACCOUNTS

Black Storm-Petrel (*Oceanodroma melania*). This species has been nesting on La Lobera since at least 1988. There are over 150 nests, but the number is hard to

estimate accurately because this species nests in crevices and under boulders, on cliffs, and in other difficult sites. The nesting season goes from February to June.

Least Storm-Petrel (*O. microsoma*). This species too has nested on La Lobera since at least 1988 (>200 nests). Like the Black, the Least Storm-Petrel lays one egg around mid March, and the chicks leave the nests in the beginning of June. The breeding habitat of both species of storm-petrel is the same.

Brown Pelican (*Pelecanus occidentalis*). We have nesting records since 1979. Although the colony has changed location, the Brown Pelican has nested fairly regularly on La Ballena: 1979, 800 nests; 1980, 600 nests; 1981, 70 nests; 1982, 300 nests; 1983, 250 nests; 1984, no nesting; 1985, 750 nests; 1986, 300 nests (Jiménez 1989); 1987, no nesting; 1988, 170 nests; 1989, 800 nests; 1990, 1200 nests; 1991, 1000 nests; 1992, no nesting. Occasionally, smaller colonies (5–20 nests) have nested on La Gallina and El Gallo. Eggs are laid in January and hatch in February. Fledglings leave the nests in May. Human disturbance has resulted in panicking chicks killing themselves by impaling themselves on cholla spines or falling from cliffs.

Blue-footed Booby (*Sula nebouxii*). On La Lobera, on high cliffs protected from the sun, one pair nested in March 1988, laying three eggs that never hatched. On the same island in May 1990, two pairs each laid three eggs and fledged two chicks.

Great Blue Heron (*Ardea herodias*). This species regularly breeds throughout La Paz Bay. Until 1988 it nested on La Gaviota (8–10 nests) in bushes and chollas no taller than 2 m. Since 1989 most of the nests (10–15) have been found at El Conchalito in the canopy of Red Mangroves (Table 1). Until 1992 two pairs nested on a metallic structure on San Rafaelito. Some isolated pairs nested on La Gallina and El Gallo in March 1988, and a colony of 10 pairs nested on San Gabriel in March 1988. The nests were located within the canopy of the Black Mangrove trees. In June 1993 a colony of 20 pairs nested on El Merito, on the tops of bushes. During 1992, although the species nested on El Conchalito, San Rafaelito, La Gaviota, and San Gabriel, all attempts failed. It seems that this ardeid has a wide spatial nesting niche.

Up to 10 species of herons nest in mangroves at El Conchalito (Table 1). We have recorded only the Great Blue Heron nesting elsewhere around La Paz Bay, however. At El Conchalito, the colonies are arranged largely in monospecific patches. The only exceptions were the two nests of the Great Egret, which were within the colony of Cattle Egrets.

Virginia Rail (*Rallus limicola*). We recorded one nest at El Conchalito in May 1988, in a Red Mangrove tree, very close to the tide level. In 1989 and 1993 courtship behavior was observed in the same area, but no nests were found.

American Oystercatcher (*Haematopus palliatus*). Palacios (1988) found one nest on Las Afeguas. We found single nests with eggs on La Gaviota in April 1989 and March 1990, and on San Rafaelito in 1989 and 1990.

Wilson's Plover (*Charardius wilsonia*). Palacios (1988) recorded two nests on Las Afeguas, four nests at Chametla, and three nests at Fidepaz during 1987. We counted 25 chicks at Chametla in 1992 and eight chicks at El Conchalito in 1993.

Heermann's Gull (*Larus heermanni*). We located two nests with two and three eggs on La Ballena in April 1990. Both nests failed.

Yellow-footed Gull (*L. livens*). Since at least 1983 a colony has been settled on La Gaviota; it had 17 nests in 1989, 15 nests in 1990, 16 nests in 1991 and 14 nests in 1993. There are four more colonies in La Paz Bay, which had the following

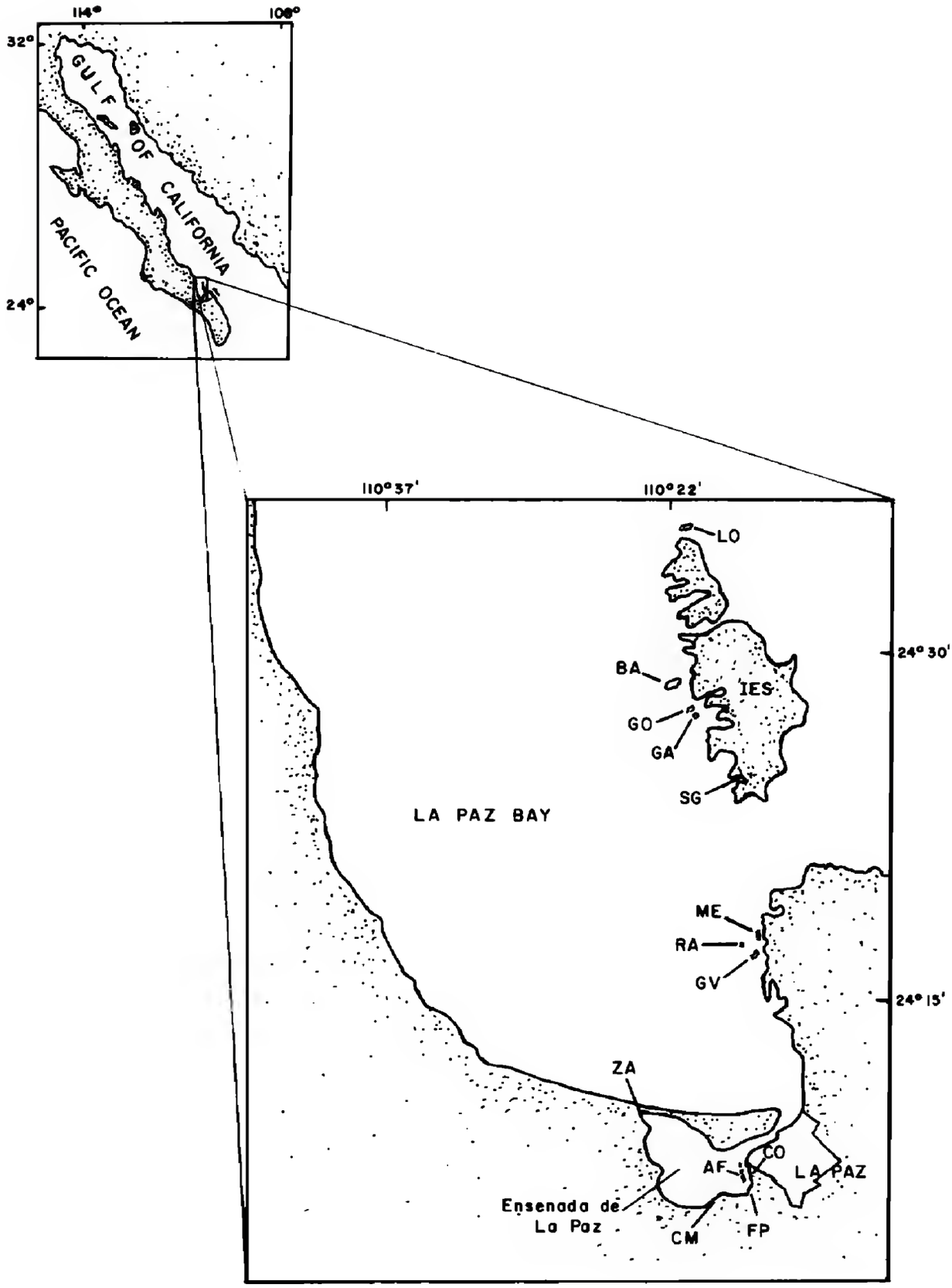

Figure 1. La Paz Bay, showing islands and other sites used by nesting waterbirds. Islands: IES, Espíritu Santo; GO, El Gallo; GA, La Gallina; LO, La Lobera; BA, La Ballena; GV, La Gaviota; ME, El Merito; RA, San Rafaelito; AF, Las Afeguas (within Ensenada de la Paz). Coastal areas: CO, El Conchalito; FP, Fidepaz; CM, Chametla; ZA, Zacatecas (within Ensenada de La Paz); SG, San Gabriel (southwest coast of Espíritu Santo Island).

Table 1 Nesting Ardeids at El Conchalito Estuary in La Paz Bay, Baja California, 1986–1991

Species	No. nests	Nesting regularity	Nesting season (hatch–fledge)	Nesting habitat[a]
Black-crowned Night-Heron (*Nycticorax nycticorax*)	± 10	annual	April–June	RM (C)
Yellow-crowned Night-Heron (*Nyctanassa violacea*)	± 30	annual	March–May	BM (H)
Green Heron (*Butorides striatus*)	1–2	1988, 1989	May–June	BM (L)
Tricolored Heron (*Egretta tricolor*)	1	1988	May–June	BM (VH)
Little Blue Heron (*Egretta caerulea*)	1+	1988, 1993	May–June	BM (VH)
Reddish Egret (*Egretta rufescens*)	2	1988	May–June	BM (VH)
Snowy Egret (*Egretta thula*)	10–15	1988, 1989	April–June	BM (VH)
Cattle Egret[b] (*Bubulcus ibis*)	± 60	annual	April–June	BM (H)
Great Egret (*Casmerodius albus*)	2	1989	April–June	WM (VH)
Great Blue Heron[c] (*Ardea herodias*)	± 15	annual	January–June	RM (VH)

[a]RM, Red Mangrove; BM, Black Mangrove; WM, White Mangrove; L, low; C, center; H, high; VH, very high.
[b]In 1993, this species moved to a location 500 m northeast.
[c]This species breeds regularly throughout La Paz Bay (see text). We estimate the entire nesting population in the bay at about 50 pairs.

numbers in 1989: La Lobera, 6 nests; La Gallina, 25 nests; El Gallo, 20 nests; La Ballena, 25 nests. We also observed 20 nests on El Merito in 1993. The eggs are laid in March, hatch about a month later, and chicks are able to fly after eight weeks (Carmona and Zárate 1992, Carmona 1993). The nests within the colonies of La Paz Bay are scattered (Carmona and Zárate 1992), as has been observed in the Yellow-footed Gull colonies of the central Gulf of California (Hand 1980, Hand et al. 1981). It seems that this scattered pattern is necessitated by thermal regulation (Hand 1980, Hand et al. 1981, Carmona 1993).

Velarde and Anderson (1993) reported 1200 nests only for Espíritu Santo Island alone, but this was a typographic error; in fact, the number should be 120 nests (D. Anderson pers. comm.).

Least Tern (*Sterna antillarum*). From 1985 to 1987 an important colony (>100 pairs) settled on Las Afeguas (Palacios 1988). Other small colonies (one to ten nests) have been found within the Ensenda de La Paz (Palacios 1988, Mendoza 1994). From 1989 to 1992 pairs tried to nest on Las Afeguas, but reproduction failed in all those years: 1989, 80–90 nests; 1990, 15–20 nests; 1991, 40–50 nests; 1992, less than 10 nests (Mendoza 1994). According to Mendoza (1994) the causes of failure

were human disturbance, depredation, and tide inundations. This species nests from May to July.

Osprey (*Pandion haliaetus*). Ospreys have nested on Espíritu Santo Island at least since 1984, with 3 nests in 1984, 11 nests in 1985, 22 nests in 1986, and 6 nests in 1988. One nest was recorded on La Ballena in 1984 and 1985. One nest was observed along the west coast of the bay in 1985 and 1986. Even though the total number of nests in the bay has fluctuated, at least two nests have always been active.

DISCUSSION

Although the number of species of waterbirds breeding in this area is relatively high, the populations are low in comparison to those of other areas of the Gulf of California. Concomitantly, although Zeitzschel (1969) and Alvarez-Borrego (1983) reported a high productivity for the Gulf, La Paz Bay is one of the poorest areas in it (Anonymous 1988). The most abundant nesting species in the bay are the Black Storm-Petrel, Least Storm-Petrel, Brown Pelican, and Yellow-footed Gull.

Regarding the Yellow-footed Gull, Everett and Anderson (1991) reported "several" colonies of less than 100 nests on Espíritu Santo Island, whereas our observations indicate 150 nests of this species at the most for all of La Paz Bay (Carmona and Zárate 1992). Moreover, Velarde and Anderson (1993) reported both the Blue-footed (22 nests) and Brown Boobies (20 nests), we have observed only the Blue-footed Booby nesting, in numbers much smaller (maximum two pairs).

Reduced success or failure of breeding seabirds during "El Niño" conditions is well known, especially for species that feed on pelagic fish such as sardine, anchovy, and mackerel (Valdivia 1978, Schreiber and Schreiber 1984). Our data exemplify this pattern as well: Brown Pelicans failed to nest and Great Blue Herons had no success in La Paz Bay in 1992, an "El Niño" year. The numbers, species, and success of the waterbirds nesting in La Paz Bay are highly variable from year to year, however, even in years of normal oceanographic conditions. Most of the waterbird populations of La Paz Bay are marginal in comparison to population centers elsewhere in the Gulf of California, and greater variability may be expected at such marginal sites. Also, human disturbance may be a factor in this area, the most important port in Baja California Sur.

Commercial and sport fishing, tourism, and general boat traffic are widespread throughout the bay. Since the waterbird colonies are so easily accessible, better protection of them is necessary, especially because they may also serve as tourist attractions. Continued monitoring of the colonies is essential to evaluating the impact of these human activities.

It seems that the populations of nesting waterbirds in La Paz Bay have fallen. A clear example is the Least Tern, reduced to only 10 nests in 1992. The growth of the city of La Paz has also contributed to this, destroying mangroves where ardeids had nested. Some fishermen have noticed a gradual decline of Yellow-footed Gull colonies, attributing this to the human consumption of eggs. All these factors urge a management plan for the area to control human effects on populations of birds.

SUMMARY

We surveyed the breeding waterbirds of La Paz, Baja California Sur, from 1979 to 1993. We recorded nesting by 17 species and discovered previously unreported colonies of the Black and Least Storm-Petrels on Isla La Lobera (just north of Isla Partida). The most abundant species was the Brown Pelican, up to 1200 pairs of which nested on Isla La Ballena, just west of Espirítu Santo Island. Two pairs of Heermann's Gull attempted nesting in 1990 on this island, a site previously unreported for this species. A colony of Least Terns at Las Afeguas on the east side of the Ensenada de La Paz, just west of the city of La Paz, failed repeatedly, essentially because of human disturbance.

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NOTES

NESTING WATERBIRDS OF SANTA MARIA BAY, SINALOA, MEXICO, APRIL 1988

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Santa Maria Bay (25°00' N, 108°10' W) extends northwest–southeast along the coast of the state of Sinaloa, Mexico, 100 km southwest of Los Mochis (Figure 1). One of the largest coastal wetlands of Sinaloa, it covers 1350 km^2 and includes several islands and extensive mudflats. It is separated from the Gulf of California by Altamura Island, a sand bar 42 km long. At low tide, most of the bay is less than one meter deep, revealing several channels ranging from 2 to 20 meters deep. The area is highly productive, owing to its mangrove forests (Dawes 1986). Santa Maria Bay supports an important fish and shrimp industry (McGoodwin 1979).

Most bird surveys in the bay have focused mainly on waterfowl (Velazquez et al. 1972, 1975, Velazquez and Ortega 1973), including waterbird surveys from 1937 to 1964 and 1979 to 1984 (Norman 1979–1982, Saunders and Saunders 1981, Conant and Novara 1983, Conant and Voelzer 1984). A report on the status and distribution of the Jabiru (*Jabiru mycteria*) and other waterbirds in western Mexico (Knoder et al. 1980) included some information on pelicans, cormorants, frigatebirds, herons, and egrets from Santa Maria Bay.

From 18 to 26 April 1988 we surveyed four mangrove islands (Pájaros, El Salero, Las Tunitas, and La Coyotilla) in the north portion of the bay to census all birds and record the species breeding there.

The surveyed islands are located 10 km southeast of the north mouth of the lagoon, around 1000 m from the inner coast of Altamura Island, between 25°03' and 25°06' N and 108°10' and 108°13' W (Figure 1). Pájaros (PI), also called Tijeretas, the largest of the four islands, is 1.7 km long and 0.5 km wide. Length and width for El Salero (ES), Las Tunitas (LT), and La Coyotilla (LC) are 0.45 by 0.4, 0.78 by 0.3, and 0.1 by 0.08 km, respectively. All except La Coyotilla are covered almost completely by Red (*Rhizophora mangle*) and Black (*Avicennia germinans*) Mangrove. White Mangrove (*Laguncularia racemosa*) is uncommon. La Coyotilla is a small shell-covered island, lacking vegetation.

The breeding species (11) and other species of interest were as follows:

Magnificent Frigatebird (*Fregata magnificens*). An estimated 15,000 pairs breed on PI. We found young in all stages of development, from eggs to fledglings. Knoder et al. (1980) mentioned this bay as an important breeding site for this species, and observed 1500 nests in January 1971, 1000 in January 1972, and 500 in July 1972. The next northernmost reported frigatebird colony is on Margarita Island, on the west coast of Baja California Sur (Moreno and Carmona 1988), and consists of about 20,000 pairs.

White Pelican (*Pelecanus erythrorhynchos*). We saw three individuals feeding near PI. The population for the whole bay has been estimated at up to 1000 (Conant and Novara 1983). The closest breeding colony (500 individuals) is located in Santiaguillo Lagoon, Durango (Knoder et al., 1984), southeast of Santa Maria Bay, but we presume that the birds in Santa Maria Bay are winter visitors from the north, probably unrelated to the Durango colony.

Brown Pelican (*Pelecanus occidentalis*). Some 1000 to 1500 pairs were nesting on PI, another eight on LT. The nests, constructed on Red and Black mangroves, contained from eggs to almost-fledged chicks. The species had been reported breeding in the area by 1947 (Saunders 1981). Knoder et al. (1980) estimated 1500 nests in the bay. The winter population has been estimated as high as 11,000 individuals (Conant and Novara 1983).

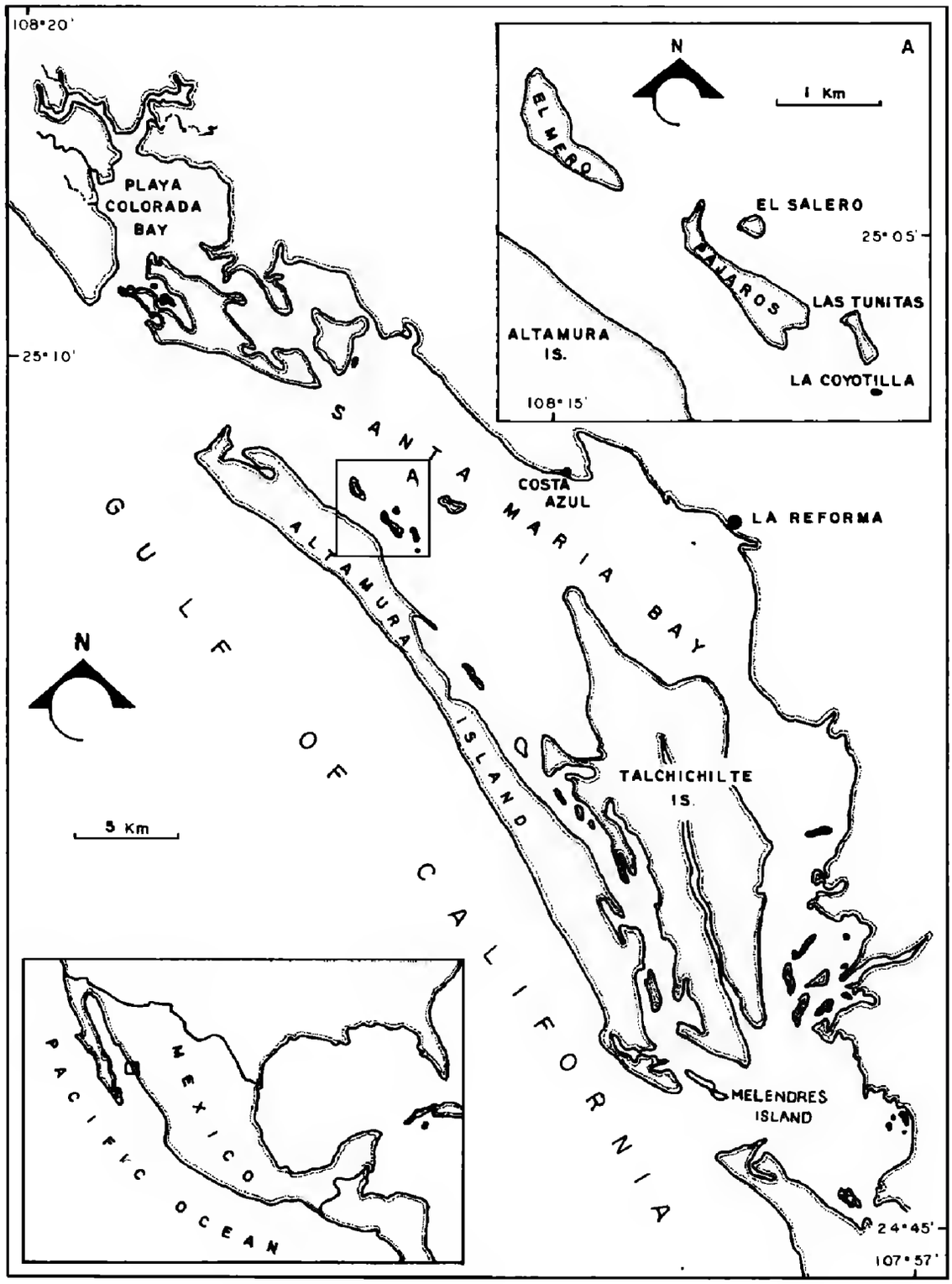

Figure 1. Santa Maria Bay, Sinaloa. A, location of the surveyed islands.

Double-crested Cormorant (*Phalacrocorax auritus*). A breeding colony of 1000 to 1500 pairs is located on PI. Built on Red and Black mangroves, nests contained from eggs to fledglings. Knoder et al. (1980) estimated 4300 and 4000 nests of *Phalacrocorax* spp. in January 1971 and 1972, respectively.

Yellow-crowned Night-Heron (*Nyctanassa violacea*). We found two subcolonies, each of 200 to 300 pairs, on PI. Most nests, in the mid-heights of Red Mangrove trees, were under construction, and only 12 of them had eggs. Additionally, two nests with eggs were in the same kind of vegetation, mixed in the Roseate Spoonbill colony (see below). Knoder et al. (1980) recorded in July 1972 several colonies of from 5 to 25 nests.

Black-crowned Night-Heron (*Nycticorax nycticorax*). We saw four individuals in breeding plumage near the colonies of the Yellow-crowned Night-Heron on PI, but did not find any nests. Knoder et al. (1980) recorded 12 nests in July 1972.

Cattle Egret (*Bubulcus ibis*). We found between 100 and 150 pairs building nests in the middle heights of Red Mangrove trees on PI. Knoder et al. (1980) recorded in July 1972 five large colonies averaging 700 pairs each, for an estimated total of 3600 pairs in the whole bay.

Great Blue Heron (*Ardea herodias*). We found four nests on the few White Mangrove trees of PI. A larger colony (150–200 pairs) is located to the south, on Melendres Island, where the White Mangrove dominantes. Probably the nesting of the Great Blue Heron, because of the size and weight of the nests, is limited in this area to the more resistant White Mangrove. Knoder et al. (1980) mentioned that the bay supported 30 to 50 pairs in 1971 and 1972.

Other ardeids. Beside those mentioned above, egrets and herons were few. We found only one nest of the Reddish Egret (*Egretta rufescens*), in one of the few White Mangrove trees of PI. We saw Snowy Egrets (*Egretta thula*), Little Blue Herons (*E. caerulea*), and Great Egrets (*Casmerodius albus*) in breeding plumage, but failed to find any nests. These numbers contrast with those reported by Knoder et al. (1980), who, in July 1972, estimated 830 nests of the Little Blue Heron, 41 nests of the Reddish Egret, 200 nests of the Great Egret, 90 nests of the Snowy Egret, and 230 nests of the Louisiana Heron (*E. tricolor*).

White Ibis (*Eudocimus albus*). We saw 52 individuals on PI, but no nests. Local fishermen suggested the species breeds on islands in southern Santa Maria Bay. Knoder et al. (1980) estimated 1750 nests for the bay, as well as 250 nests on Talchichilte Island, south of Santa Maria Bay.

Roseate Spoonbill (*Ajaia ajaja*). The 600 pairs were distributed in several groups, the largest of around 300 pairs. All nests were in the middle and bottom portions of Red Mangrove trees, and most of them contained eggs. Knoder et al. (1980) reported a single colony of only 18 nests.

Black-bellied Whistling-Duck (*Dendrocygna autumnalis*). Although we only saw two individuals flying south over PI, local fishermen considered this species very common. Norman et al. (1979) and Conant and Voelzer (1984) reported 40 and 100 individuals in 1979 and 1984, respectively. We found on both LT and ES some nest structures that might belong to this species.

Osprey (*Pandion haliaetus*). Around 40 pairs of this species breed in the area. We found nests as close as 15–20 m from one another, on various substrates but always high from the ground. We found nests on all the islands visited except the barren LC. Henny and Anderson (1979) observed only one nest along the Mexican coast from Punta Baradito to Mazatlan, including Santa Maria Bay. Conant and Voelzer (1984) reported five nests for the bay.

American Oystercatcher (*Haematopus palliatus*). We found one nest with two eggs on LC, the only island with proper nesting substrate for this species.

Least Tern (*Sterna antillarum*). We saw four individuals courting. This threatened species (Palacios 1989) might breed on Altamura Island, where there are sand beaches suitable for its nesting.

Aerial counts of birds made in mangrove areas like this should be carefully reviewed. Such counts tend to underestimate less conspicuous birds and nests. Conversely, counts from randomly selected transects extended to large areas tend to overestimate aggregated populations. Thus differences in technique might explain some of the differences between our data and those of Knoder et al. (1984). Those authors based their estimates on aerial surveys with no terrestrial verification. The greater geographical and seasonal extent of their surveys, however, represents a broader perspective than does our data.

Agriculture is one of the most important economic activities in Sinaloa, so pesticides may be found in Santa Maria Bay, carried by the several streams that flow into it. Although we observed no anomalies related to pesticides, they represent a potential threat to the species nesting there.

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Magnificent Frigatebird *Sketch by Jamie M. Chavez*

COLORATION FREQUENCIES OF MALE HOUSE FINCHES IN HAWAII

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In North America male House Finches (*Carpodacus mexicanus*) most often have parts of the head, breast, and rump colored red (Michener and Michener 1931). But in Hawaii, where the species was introduced prior to 1870 (Grinnell 1911), males show considerably more color variation, with yellow or orange frequently replacing the red. Largely on the basis of this difference in the males' coloration, Grinnell (1912a,b; later supported by Moore 1939) proposed the Hawaiian population as a separate species, "*Carpodacus mutans*," a proposal not generally accepted (e.g., AOU 1983).

Grinnell (1911) indicated that most male House Finches are colored yellow or orange on all the main Hawaiian Islands. Dunmire (1961), however, pointed out that males found at Haleakala, Maui, were mainly yellow or orange while the ones at Kilauea, Hawaii, were mostly red. During our work on the House Finch in Hawaii (Hirai 1975, van Riper 1974, 1976), we also noted marked differences in the proportions of red, orange, and yellow birds on different islands. We here present the first quantified information concerning the proportions of House Finch color phases in Hawaii.

Between 1973 and 1980 we documented the coloration of male House Finches on three main Hawaiian islands (Oahu, Lanai, and Hawaii). We made too few observations on Molokai, Maui, and Kauai to include those islands in our statistical analyses. On Lanai data on House Finch color were collected visually (see Hirai 1978), while on the other two islands data were collected both visually and by mist-netting birds. Since within each site the proportions of color categories derived from field observation and mist-netting did not differ significantly, data from the two methods were combined. On Oahu, birds were captured and observed within a 90-ha area centered on the University of Hawaii campus in the lower Manoa Valley, on Lanai within an 800-ha area north of Lanai City. Data for the larger island of Hawaii came from two widely separated locations: a 75-ha study area at Puu Laau on the southwestern slope of Mauna Kea (see van Riper 1987) and a 200-ha area on the Mauna Loa Strip Road in Hawaii Volcanoes National Park (see van Riper et al. 1986).

We assigned each male House Finch to one of three color categories: yellow, orange, or red. In an effort to eliminate the influence of wear and fading, all color data were collected between July and December, the postbreeding period in Hawaii (Hirai 1975, van Riper 1976). Efforts were also made to minimize the possibility of multiple observations of the same bird by counting birds along transects and at extended intervals between observation periods (e.g., see Hirai 1978). Banded birds were recorded only once; all recaptures and visual sightings of banded birds we eliminated from data analyses. All data were analyzed with chi-square tests; we accepted a difference as significant when the test indicated its probability was less than or equal to 0.05.

We found that frequencies of male House Finch coloration varied from Oahu to Lanai to Hawaii (Table 1). On the island of Hawaii, 49% of the males on Mauna Kea were red (the two Hawaii sites together averaged 43% red), while Lanai had about 25% and Oahu only 5% red males. The differences among the color-phase compositions of House Finch populations on each of the three islands ($\chi^2 = 120.7$) were

Table 1 Coloration of Male House Finches in the Hawaiian Islands, 1973–1980

			Hawaii	
Color	Oahu	Lanai	Mauna Kea	Mauna Loa
Yellow	51 (54.8%)	66 (38.8%)	17 (6.3%)	4 (4.3%)
Orange	37 (39.8%)	61 (35.9%)	121 (45.2%)	63 (68.5%)
Red	5 (5.4%)	43 (25.3%)	130 (48.5%)	25 (27.2%)
Island totals	93	170	360	

significant. There was even a significant difference between the two populations sampled on the island of Hawaii ($\chi^2 = 15.1$). Interestingly, one male observed on Mauna Kea in November 1974 had a red head and yellow rump while another bird mist-netted in October 1978 had a red head and orange rump.

From the literature, on Kauai and Maui (Dunmire 1961), and probably Niihau (Fisher 1951), it appears that most males are colored yellow or orange. On Maui we have observed mainly orange House Finches, while on Kauai we recorded 22% red, 45% orange, and 33% yellow males ($n = 9$). Although color frequencies differed significantly at each location that we examined, it appears that Hawaii is the only island with a substantial fraction of red House Finches.

Michener and Michener (1931) trapped 1226 male House Finches in California, noting 1001 as red (81.6% of the total) and 225 as yellow, orange, or orange-pink (18.4%). The difference between this ratio of red and non-red House Finches in California and that on Hawaii is significant ($\chi^2 = 209.7$).

The causes of these variations in color frequency in Hawaii are not yet completely known. Grinnell (1911) implied that the differences were genetically and physiologically based, brought about by the close inbreeding of the small original stock introduced to the Hawaiian islands. Dunmire (1961) felt that the differences were caused by diet rather than heredity. More recently, laboratory studies by Brush and Power (1976) strongly suggested that dietary factors, in concert with physiological ones, may account for differences in House Finch hues. They demonstrated that birds molt in red feathers if fed canthaxanthin. A simple test would be to capture yellow males in Hawaii, pluck a few feathers, and record how they grow back with and without dietary pigment supplements. The explanation that is finally accepted for these coloration differences will have to account for our observational differences in color frequencies of male House Finches among islands in the Hawaiian archipelago and between these islands and California.

Our appreciation goes to the many organizations and people who kindly provided assistance during our work in Hawaii. This research was partly supported by National Science Foundation grant GB 23230 and a U.S. Department of Agriculture Hawaiian Fruit Flies Laboratory award to Dr. Andrew J. Berger, World Wildlife Fund grant US-35, Earthwatch, and funding from the National Park Service to the Cooperative National Park Resources Studies Units at the University of Hawaii and Northern Arizona University. We are also grateful to Tim Manolis and Dennis Power for their insightful reviews of this paper.

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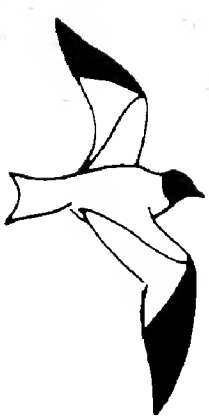

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Cover photo by © Thomas Gatz of Phoenix, Arizona: Tufted Duck *(Aythya fuligula)* with Ring-necked Ducks *(Aythya collaris)*, Red Mountain Ranch, Mesa, Arizona, January 9, 1993. First record of Tufted Duck for Arizona.

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IDENTIFICATION OF MANX-TYPE SHEARWATERS IN THE EASTERN PACIFIC

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Recent seabird identification guides (e.g., Tuck and Heinzel 1978, Harrison 1983, 1987) and articles on the Manx Shearwater (*Puffinus puffinus*) complex (e.g., Jehl 1982, Bourne et al. 1988), do not satisfactorily address the problem of separating the Manx Shearwater (*P. puffinus*) from Newell's (*P. auricularis newelli*) and Townsend's (*P. a. auricularis*) shearwaters, presumably because Townsend's and Newell's are Pacific Ocean species while Manx is essentially a bird of the Atlantic Ocean. The Manx, however, is a long-distance migrant that has occurred in the Pacific off Australia and New Zealand (Kinsky and Fowler 1973, Lindsey 1986, Tennyson 1986) and off Washington state, in September–October 1990 and September–October 1992 (Tweit and Gilligan 1993). In addition, five California records of the Manx from July to October 1993 have been submitted to the California Bird Records Committee (M. A. Patten pers. comm.). Here, on the basis of museum and literature research, combined with extensive field experience of this complex, we summarize identification characters of the Manx, Townsend's, and Newell's shearwaters.

METHODS

We examined specimens of these three forms, plus the Black-vented Shearwater (*P. opisthomelas*), at the American Museum of Natural History (AMNH; n = 35 Manx, 14 Townsend's, 1 Newell's), New York, the Bishop Museum (BM; n = 30 Newell's), Honolulu, the California Academy of Sciences (CAS; n = 9 Townsend's), San Francisco, the Los Angeles County Museum of Natural History (LACM; n = 3 Townsend's), and the Museum of Vertebrate Zoology, University of California, Berkeley (MVZ; n = 3 Manx, 1 Townsend's). In addition, personnel at AMNH, BM, LACM, the Carnegie Museum of Natural History (CM; n = 6 Townsend's), Pittsburgh, and the U.S. National Museum (USNM; n = 8 Townsend's, 40 Newell's), Washington, D.C., kindly provided further data on specimens at those institutions.

We researched published literature, as well as unpublished information from Point Reyes Bird Observatory's (PRBO) on-going research on Newell's Shearwaters nesting in Kauai, Hawaii. Our field experience with this complex comprises about 6000 hours of at-sea and land-based observation of thousands of each form.

RESULTS AND DISCUSSION

The only small shearwater occurring regularly off California is the Black-vented (A.O.U. 1983), the plumage variation of which was discussed by Loomis (1918) and Everett (1988). The field separation of this species from Townsend's, Newell's, and Manx shearwaters should not be a problem if the bird is seen well. Characters distinguishing Townsend's and Newell's from the Black-vented were discussed adequately by Jehl (1982). The main features of the Black-vented are its lack of white flank patches and its dark brownish upperparts blending smudgily into whitish underparts (versus sharply contrasting blackish upperparts and white underparts of the others). Although one bird in more than 50,000 Black-vented Shearwaters we have seen showed white flank patches (Pyle pers. obs.), we consider this to have been an aberrant individual; in all other respects it looked like a typical Black-vented Shearwater. Howell and Engel (1993) discussed differences between Townsend's and the eastern Pacific race of Audubon's Shearwater, *P. lherminieri subalaris*.

Size and Shape

Manx, Townsend's, and Newell's shearwaters are all about the same size as the Black-vented Shearwater, and all four fly in a similar manner, so size and flight are unlikely to be useful identification points, particularly with a lone bird. Townsend's averages longer-tailed than Manx, and Newell's averages longer-tailed than Townsend's, with virtually no overlap between Newell's and Manx (Table 1). Newell's generally appears fairly long-tailed in the field, although we doubt this would help in separating it from Townsend's (note overlap in Table 1). Recently fledged Newell's (in October and November) and birds in worn plumage can be short-tailed; e.g., the type specimen of Newell's has a tail of 76 mm (King and Gould 1967) or 77

Table 1 Tail Lengths and Widths of Distal Black Undertail Band (in mm) of Manx, Newell's, and Townsend's Shearwaters

	Tail length Range (Mean ± SD[a])	Distal black undertail band[b] Range (Mean ± SD)
Manx (n = 38)	68–79 (72.4 ± 2.7)	4–21 (9.9 ± 4.3)
Newell's (n = 38)	77–89 (83.9 ± 3.0)	20–46 (35.2 ± 6.8)
Townsend's (n = 41)	71–83 (76.3 ± 3.0)	43–72 (59.0 ± 7.8)

[a]SD, standard deviation.
[b]See Figure 1.

mm (Loomis 1918), within the range of the Manx. Tail length thus appears of little use in separating Townsend's from either Manx or Newell's but could be helpful in distinguishing between Newell's and Manx.

Upperpart Coloration

As noted above, Manx, Townsend's, and Newell's are basically blackish above and white below. Manx and Newell's have been described as blacker dorsally than Townsend's, which is browner (Jehl 1982), and Newell's has been noted as blacker dorsally than Manx (Dunn 1988). We were unable to compare similarly fresh (blacker) or worn (browner) specimens of all three forms directly, although we found fresh-plumaged Manx as black dorsally as Townsend's, and Loomis (1918) noted that fresh-plumaged Townsend's are as black dorsally as Newell's. Because of variable lighting, plumage fading, plumage wear, and poorly known molt schedules of immature birds, subtle differences in the blackness of the upperparts appear not to be useful in identifying a lone bird at sea.

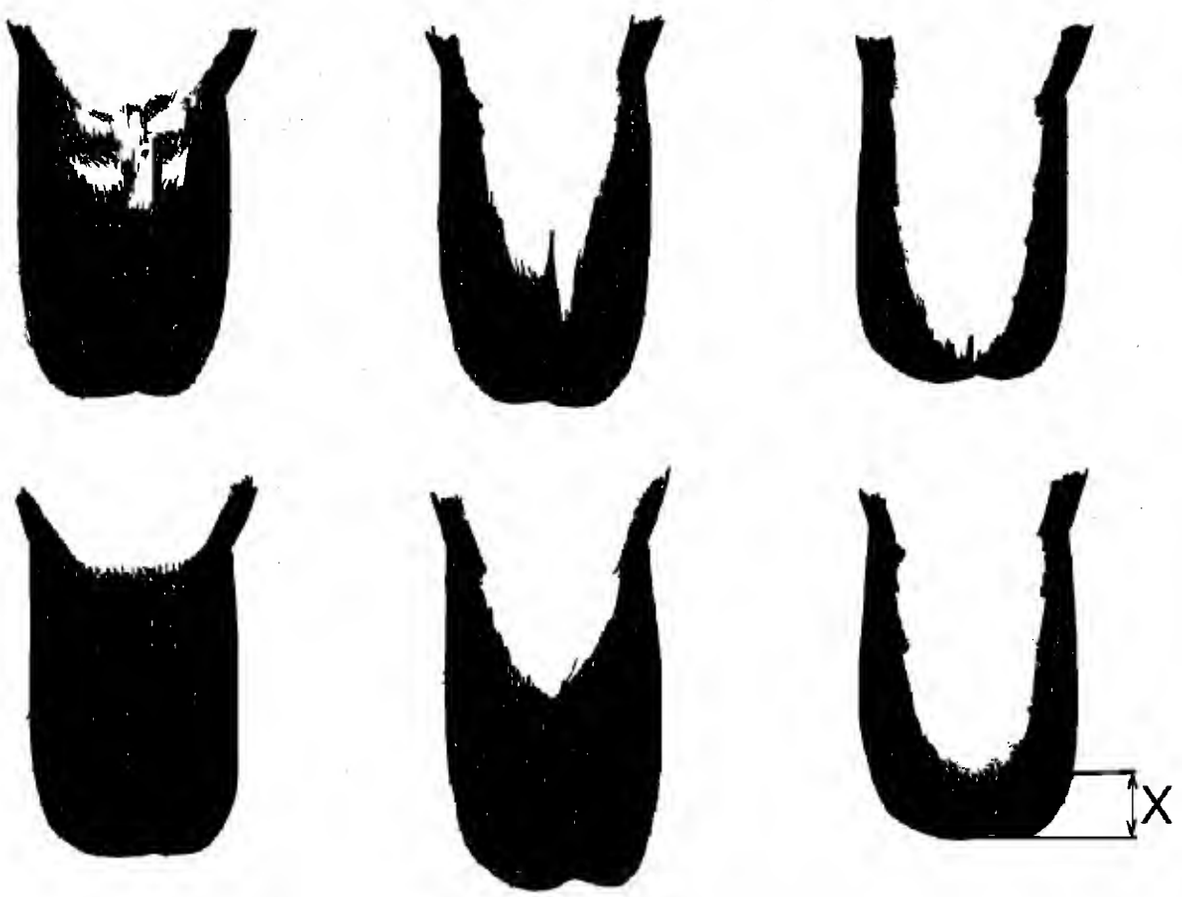

Figure 1. Variation (minimum extent of black above, maximum extent of black below) in undertail covert pattern of Townsend's (left), Newell's (center), and Manx (right) shearwaters. The lower figure is typical of Townsend's, whereas most Newell's have patterns intermediate between the upper and lower figures. Only juveniles of the Manx show as much dark as the lower figure. Note that Manx is overall white-vented, Townsend's is black-vented, with Newell's intermediate between these two extremes. See Table 1 for measurements of the distal black undertail band (distance X).

Sketch by Steve N. G. Howell

Face and Neck Pattern

As Jehl (1982) noted, Newell's shows a more sharply defined border between the black and white through the face than does Townsend's, which shows some dark freckling in this region, making the border more diffuse (Figure 2). The Manx Shearwater has a face and neck pattern similar to Townsend's (freckled and not sharply demarcated through the face; Figure 2). We agree with Jehl (1982) that these patterns are likely to be useful only at close range. Another feature that may be helpful at close range is the narrow band of pale feathers across the base of the maxilla shown by many Manx Shearwaters (e.g., numerous photos, and 20 of 36 specimens; Figure 2). No specimens or photos of Townsend's or Newell's we examined showed this feature; in these forms the forehead is solidly black (Figure 2).

The extent of dark on the sides of the neck and chest varies considerably in all three forms. Differences suggested by Jehl's (1982) figure 3 are an artifact of the preparation of the specimens shown; specimens of Townsend's Shearwater at CAS match the neck pattern of the upper Newell's shown by Jehl. Manx Shearwaters also match the pattern of Townsend's (although the neck sides of the latter are perhaps slightly blacker), and we consider neck pattern of no use in distinguishing these three forms.

Flank Patch

The white flank patch of Townsend's (formed by clean white longest flank feathers) was first noted by Jehl (1982) as a field mark distinguishing it from the Black-vented and Audubon's shearwaters. Newell's also shows white flank patches like Townsend's, although the patches on both forms can be inconspicuous (Howell and Engel 1993; pers. obs.). Furthermore, up to 30% of several hundred Manx Shearwaters studied critically in April and May (off Wales and England; Howell), in August (off New Brunswick; J. L. Dunn, photos), in September (off Maine; Pyle), and in November (off Chile; Howell) showed distinct white flank patches, with some birds being similar to a typical Townsend's or Newell's. Also, 18 of 38 specimens of the Manx had mostly white flanks that probably would appear as patches, although the flank feathers are not as long as on Townsend's; in the other 20 specimens, the flanks were marked with blackish and at sea probably would not look like white patches. Thus, extensive white flank patches strongly suggest Townsend's or Newell's but may not eliminate the Manx. A bird clearly lacking white flank patches is most likely a Manx but could be a Townsend's or Newell's molting its flank feathers.

Evaluating the presence and extent of white flank patches demands care. If viewed from the side or above, with the wings held bowed (as on the bottom of a downstroke), all three forms show a white flank patch between the black upperwing and the black thighs. The extent to which these white patches extend up onto the sides of the rump, as in typical Townsend's and Newell's, is best seen when the bird is flying slightly away from the observer. Critical prior experience with one or more forms is desirable in evaluating the extent of white flank patches.

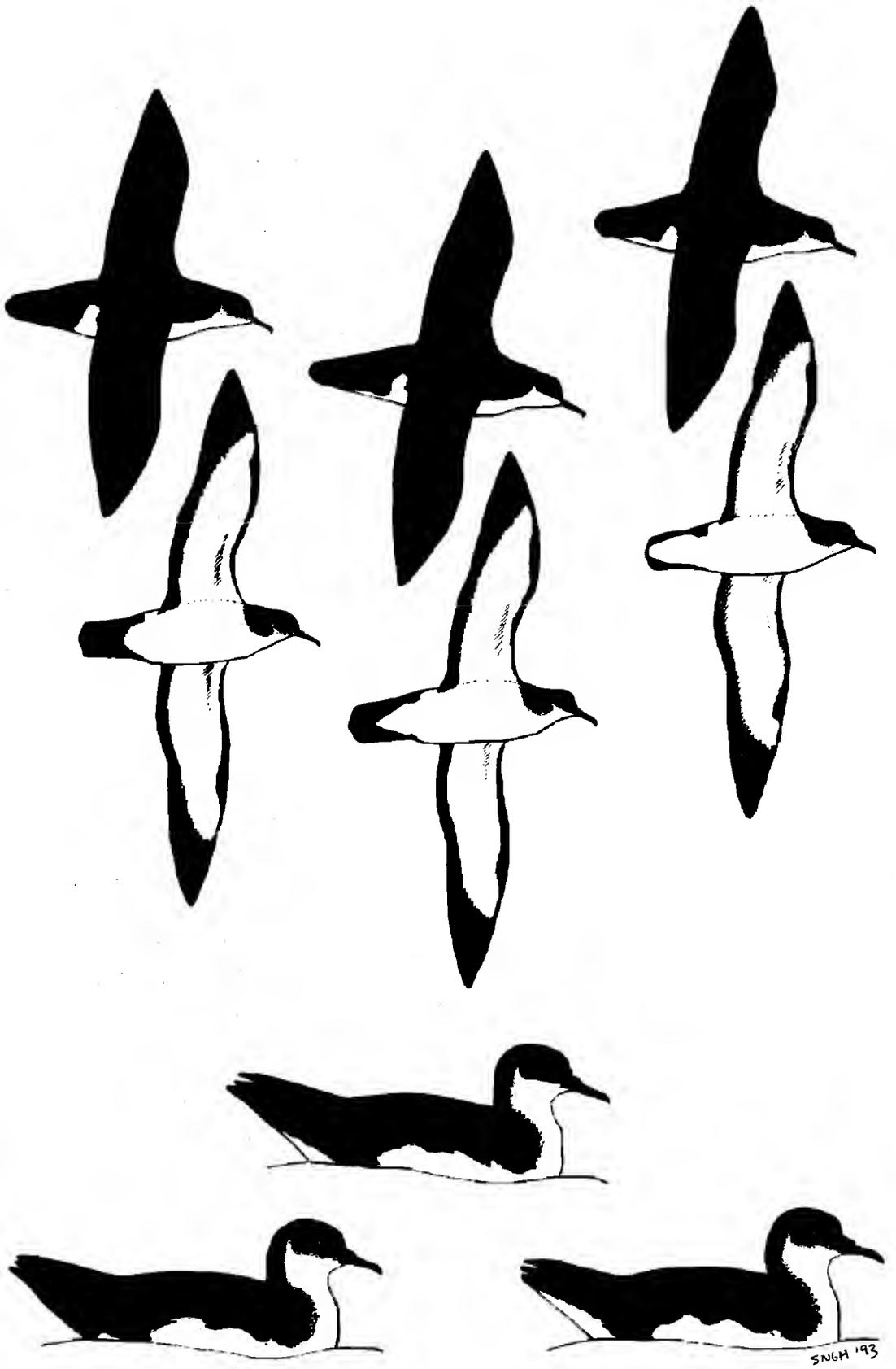

Figure 2. Comparison of Townsend's (left), Newell's (center), and Manx (right) shearwaters. Note the longer tail of Newell's relative to the Manx (but see Table 1) and the different undertail covert patterns of all three forms (also see Figure 1). See text for other differences.

Sketch by Steve N. G. Howell

Undertail Covert Pattern

The best feature for distinguishing the three forms is the pattern of the undertail coverts. The undertail coverts of these shearwaters are long, reaching almost to the tip of the tail and covering most of the underside of the closed tail. Because clear views from directly below are seldom possible at sea, and because black undertail coverts often cannot be distinguished from black rectrices, it is usually easier to determine the extent of black distally on the undertail (Figures 1 and 2, Table 1).

Manx Shearwaters older than one year have white undertail coverts, with black restricted to the outer webs of the lateral undertail coverts (Figure 1, upper). Birds in juvenal plumage (identified by axillar pattern; Baker 1993) also show dusky markings at the tips of the longest undertail coverts, which are still mostly white (Figure 1, lower). In the field, therefore, the Manx looks white-vented (Figure 2). If a bird is seen from above, however, shadowing combined with the blackish thighs can suggest the dark vent of Townsend's Shearwater, and from the side the undertail pattern can appear white basally and black distally, like that of Newell's Shearwater. With birds on the water, the white appears as an extensive wedge under the tail (Figure 2).

For Townsend's Shearwater, Jehl (1982) indicated that "the undertail coverts are uniformly blackish." In fresh plumage, some undertail coverts of Townsend's have small white tips unlikely to be visible other than in the hand. Loomis (1918) also noted that some Townsend's have white proximal undertail coverts and concluded "there are no constant characters differentiating the Hawaiian form from the Revilla Gigedo birds." Two specimens (CAS 810, 811; Townsend's by tail length and locality) confirm this variation in undertail covert pattern (Figure 1, upper). However, while a Townsend's with white proximal undertail coverts may approach the pattern of some Newell's, the white proximal coverts of Townsend's are patchy and do not form such a noticeable and solid white area as on Newell's (Figure 1). Also, in the absence of molt, the white central area on the undertail coverts of Newell's is typically tapered, or V-shaped, while on Townsend's it is more rounded or irregular (Figure 1). On the water, Townsend's typically appears all dark under the tail (Figure 2).

Descriptions of the undertail coverts of Newell's have varied. For example, figure 3 in Jehl (1982) shows two specimens of Newell's with undertail coverts white proximally and black distally (the feet obscure the exact extent of white). On the other hand, Harrison (1987) noted that Newell's differs from Townsend's in its "white or mixed black and white undertail-coverts," and Pratt et al. (1987) said "undertail coverts white" for Newell's.

We know of no evidence that Newell's ever has all-white undertail coverts. Museum specimens, photographs, live birds we have handled, and birds seen clearly at sea all showed undertail coverts about half white and half black (Figures 1, 2), as noted by Jehl (1982). Prior confusion may have resulted from observers' being unfamiliar with the extent of undertail coverts covering the underside of the tail (see above). Superficially, however, Newell's appears "white-vented" because the central white area is

generally V-shaped, the same shape as the undertail coverts overall, and the blackish distal and lateral undertail coverts do not differ obviously from the rectrices (Figure 2). The pattern of the undertail coverts of Newell's is actually intermediate between that of Manx and Townsend's. Those Newell's with the most white approach the pattern of the Manx, but the lateral and most distal tail coverts are more extensively black, contributing to a broader black distal area under the tail (Figures 1 and 2; Table 1).

In summary, most birds can be separated by the width of the dark distal undertail band formed by the rectrices and dark undertail coverts. This is generally 5–20 mm wide on the Manx Shearwater, 25–45 mm wide on Newell's Shearwater (30 mm on the type specimen), and 50–70 mm wide on Townsend's Shearwater (67 mm on the type specimen). These differences are detectable at sea under most condiditons when, in direct flight, the feet of shearwaters are tucked in and not visible, enabling clear views of the undertail pattern. The feet of birds alighting on, or taking off from, the water, however, can block the undertail pattern. This may also occur rarely in direct flight, leaving an impression of dark undertail coverts on the Manx Shearwater. Observers should also take into account the effects of lighting, such as bright sun reflecting off the water and making white areas look more extensive than they actually are, or shadows making white areas appear dark. Also, molt of the the longest central undertail coverts of a Manx Shearwater may cause the undertail to show more black than usual at the tip.

Underwing Pattern

Dunn (1988) pointed out that Newell's shows more contrast of flight feathers to underwing coverts than does the Manx Shearwater. While both Townsend's and Newell's have the under surface of their remiges blackish gray, versus a paler, more silvery gray in the Manx, we agree with Dunn (1988; pers. comm.) that this character is subject to variations in lighting and could be of use only under ideal conditions.

The underwing coverts of all three forms are mostly white, with a dark or dusky bar on the proximal lesser coverts. This bar generally shows up most strongly on Townsend's Shearwater but is also present on Manx and Newell's. Thus underwing pattern is not likely to be useful for distinguishing these three forms at sea.

SUMMARY

Field separation of Manx, Newell's, and Townsend's shearwaters is not always easy and requires clear and preferably prolonged views of a bird. The effects of lighting, wear, and molt should always be considered, and an evaluation of all possible features should be used. The pattern of the undertail coverts is the most useful feature: Townsend's has black undertail coverts, Manx has white undertail coverts, while Newell's has a pattern intermediate between these two extremes, with black distal and lateral coverts and white central proximal coverts (Figures 1 and 2). Differences in face pattern are useful but require close-range views: look for the cleaner-

cut black and white facial division of Newell's and the narrow pale band over the bill of Manx (Figure 2). Birds with prominent white flank patches are most likely Townsend's or Newell's; those lacking them are more likely Manx. The longer tail of Newell's compared with Manx may be a useful feature; the tail length of Townsend's is intermediate between that of the Manx and Newell's.

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Manx-type shearwater, two miles west of Point Joe, Monterey County, 29 August 1993.

Photo by Rod Norden

AN EIGHT-YEAR CENSUS OF BIRDS OF VALLECITO CREEK, ANZA–BORREGO DESERT, CALIFORNIA

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The Anza–Borrego Desert is a western extension of the Colorado Desert in San Diego and Imperial counties, California. Its western portion is dotted with oases and year-round streams that are major attractants for birds. Information about the birds of these habitats is scanty; published information is restricted to annual Christmas Counts in the Borrego Valley [*Am. Birds* 40 (4):979, 1986; 41 (4):1234, 1987; 43 (4): 1130, 1989; 44 (4):955, 1991; 45 (4):961, 1992] and to notes under individual species in Garrett and Dunn (1981) and Unitt (1984). To the best of our knowledge there has never been a regular bird census of a riparian (or any other) habitat in the Anza-Borrego Desert that has covered all seasons and spanned several years. Other southern California desert areas have not been served much better, with the exception of Morongo Valley in the Mojave Desert, where a breeding-bird census has been conducted for many years (Cardiff 1992). In 1984 Massey purchased a winter retreat in Earthquake Valley and was spurred to find a suitable site for regular birdwatching. The area selected was along Vallecito Creek in the southern part of the desert (Figure 1), and birdwatching evolved into the regular monthly counts reported here.

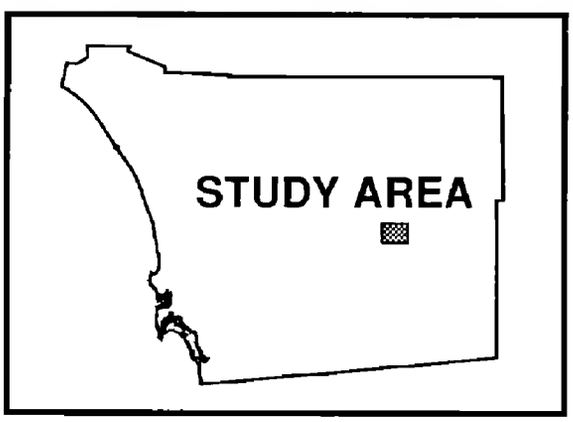
STUDY AREA AND METHODS

Vallecito Creek originates in the Laguna Mountains in San Diego County, California, and flows east into the Anza-Borrego Desert (Figure 1). Over most of its course surface flow is intermittent, but for a stretch of approximately 2.5 km (1.5 mi) between Mason and Vallecito valleys it is permanent. Water surfaces at Vallecito Wash at 580 m (1900 ft) elevation, then runs through a steep-sided canyon north and east of Campbell Grade on County Highway S-2 (Overland Stage Route). The valley broadens and flattens below the grade, and the stream finally vanishes into a sandy alluvial fan about 12 m (40 ft) lower than where it surfaced. The stretch of the stream from where the gorge begins to widen down to where the water goes underground (Figure 1) was the site of our census from 1985 to 1992.

The study area is vegetated with Colorado Desert Wash Scrub and a blend of Sonoran Creosote Scrub and Sonoran Mixed Woody and Succulent Scrub (Holland 1986). In the upper third of the study area, where the stream is channeled through a narrow gorge, Torrey Mesquite (*Prosopis glandulosa* var. *torreyana*), Catclaw (*Acacia greggii*), Arrowweed (*Pluchea sericea*), Salt Cedar (*Tamarix chinensis*) and saltbushes (*Atriplex* spp.) grow along the banks, and cattails (*Typha latifolia*) and bulrushes (*Scirpus* sp.) grow in patches in the stream itself. In the middle reach, where the gorge broadens, there are several clusters of willows (*Salix* sp.) and a single

young Fremont's Cottonwood (*Populus fremontii*). Figure 2 was taken in this section. The lower third is a sandy wash along which grow Desert Willows (*Chilopsis linearis*). The stream in this region is slower and choked with Watercress (*Nasturtium officinale*), Wild Celery (*Apiastrum angustifolium*), Stinging Nettle (*Urtica holosericea*), and Cocklebur (*Xanthium strumarium*). On the adjacent hillsides the transition to desert vegetation is abrupt, and Creosote (*Larrea tridentata*), Ocotillo (*Fouquieria splendens* var. *splendens*), several species of cholla (*Opuntia* spp.), and Desert Agave (*Agave deserti*) grow densely.

Rainfall data from 1966 to the present are available from Agua Caliente County Park, located approximately 11.25 km (7 mi) south of the study area. During the study period, total annual rainfall varied from 0.61 cm (0.24 in) in 1988–89 to 21.1 cm (8.29 in) in 1984–85 [average 10.8 cm



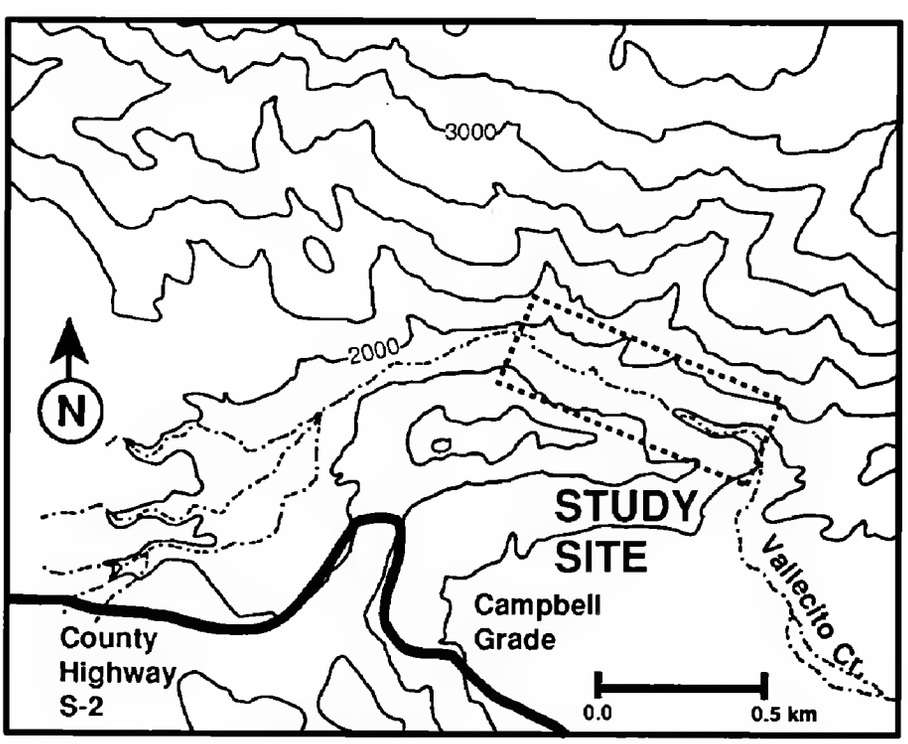


Figure 1. Location of the Vallecito Creek study area. Above, outline of San Diego County; below, section of Vallecito Creek where censusing was done.

Figure 2. A representative section of the study area on Vallecito Creek. View is south with Vallecito Valley in the middle ground and the Laguna Mountains in the background.

Table 1 Monthly Distributions of Bird Censuses, Mean Numbers of Species, and Mean Numbers of Individuals along Vallecito Creek, 1985–1992

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Number of visits													
1985	—	—	2	2	—	—	—	—	1	—	4	1	10
1986	1	1	2	2	1	—	—	—	—	2	—	3	12
1987	2	1	3	1	1	—	—	—	1	1	4	—	14
1988	—	2	3	1	1	—	—	—	1	1	1	1	11
1989	2	—	3	1	3	1	—	—	1	1	2	1	15
1990	2	—	2	1	4	—	1	—	—	1	1	2	14
1991	2	2	1	4	3	1	1	—	1	1	2	1	19
1992	2	—	3	1	3	1	—	1	1	—	2	1	15
Totals	11	6	19	13	16	3	2	1	6	9	15	9	111
Mean number of species seen per month													
1985	—	—	24	27		—	—	—	23	—	22	21	
1986	18	17	21	31	21	—	—	—	—	26	—	19	
1987	21	23	27	23	25	—	—	—	22	18	24	—	
1988	—	26	27	37	16	—	—	—	15	21	16	16	
1989	17	—	24	26	25	20	—	—	18	19	21	23	
1990	23	—	25	32	27	—	13	—	—	19	22	17	
1991	18	16	30	32	29	22	23	—	19	21	18	18	
1992	20	—	22	27	28	23	—	11	15	—	19	23	
Mean number of individuals seen per month													
1985	—	—	130	137	—	—	—	—	88	—	93	92	
1986	58	106	183	208	138	—	—	—	—	101	—	58	
1987	72	57	77	88	77	—	—	—	108	35	84	—	
1988	—	132	133	82	54	—	—	—	86	82	80	43	
1989	53	—	149	134	95	113	—	—	120	82	80	78	
1990	107	—	115	158	113	—	46	—	—	43	132	112	
1991	87	54	116	128	145	140	104	—	59	106	114	66	
1992	94	—	119	146	130	95	—	20	82	—	101	107	

Table 2 Occurrence of Species at Vallecito Creek by Month, 1985–1992

COMMON NAME	SCIENTIFIC NAME	STATUS [a]	MONTHLY OCCURRENCE J	F	M	A	M	J	J	A	S	O	N	D
Snowy Egret	*Egretta thula*	OV					■							
Green-winged Teal	*Anas crecca*	OV		■										
Cinnamon Teal	*Anas cyanoptera*	OV			■									
Turkey Vulture	*Cathartes aura*	OV			■	■								
Northern Harrier	*Circus cyaneus*	OV											■	
Sharp-shinned Hawk	*Accipiter striatus*	WV		■	■	■					■		■	■
Cooper's Hawk	*Accipiter cooperi*	WV		■							■		■	■
Red-tailed Hawk	*Buteo jamaicensis*	YR	■		■	■	■	■	■				■	■
American Kestrel	*Falco sparverius*	OV									■			
California Quail	*Callipepla californica*	YR,n	■	■	■	■	■	■	■	■	■	■	■	■
Virginia Rail	*Rallus limicola*	WV	■	■	■	■	■				■	■	■	
Sora	*Porzana carolina*	OV [b]		■	■	■								
Common Snipe	*Gallinago gallinago*	WV	■	■	■									
White-winged Dove	*Zenaida asiatica*	YR,n	■	■	■	■	■	■	■		■	■	■	■
Mourning Dove	*Zenaida macroura*	YR,n	■	■	■	■	■	■	■	■	■	■	■	■
Greater Roadrunner	*Geococcyx californianus*	YR,n	■			■	■	■					■	
Great Horned Owl	*Bubo virginianus*	OV [b]												
Lesser Nighthawk	*Chordeiles acutipennis*	SR,n [b]			■		■	■	■		■			
White-throated Swift	*Aeronautes saxatalis*	OV [b]						■						
Anna's Hummingbird	*Calypte anna*	YR,n	■	■	■	■	■	■	■			■	■	■
Costa's Hummingbird	*Calypte costae*	YR,n [b]	■	■	■	■	■	■	■		■	■	■	■
Rufous Hummingbird	*Selasphorus rufus*	RM												
Allen's Hummingbird	*Selasphorus sasin*	OV												
Red-breasted Sapsucker	*Sphyrapicus ruber*	OV										■		
Ladder-backed Woodpecker	*Picoides scalaris*	YR,n	■										■	■
Northern Flicker	*Colaptes auratus*	WV		■	■						■	■	■	■
Olive-sided Flycatcher	*Contopus borealis*	OV					■							
Western Wood-Pewee	*Contopus sordidulus*	RM				■	■				■			
Willow Flycatcher	*Empidonax traillii*	RM					■							
Hammond's Flycatcher	*Empidonax hammondii*	OV												
Pacific-Slope Flycatcher	*Empidonax difficilis*	RM	■			■	■				■	■		■
Black Phoebe	*Sayornis nigricans*	YR	■	■	■		■				■	■	■	■
Say's Phoebe	*Sayornis saya*	YR	■	■	■	■	■	■	■	■	■	■	■	
Vermilion Flycatcher	*Pyrocephalus rubinus*	OV [b]												■
Ash-throated Flycatcher	*Myiarchus cinerascens*	SR,n [b]				■	■	■	■		■			
Cassin's Kingbird	*Tyrannus vociferans*	RM												
Western Kingbird	*Tyrannus verticalis*	RM												
Tree Swallow	*Tachycineta bicolor*	OV				■						■		
Barn Swallow	*Hirundo rustica*	OV				■								
Scrub Jay	*Aphelocoma coerulescens*	OV												■
Common Raven	*Corvus corax*	YR	■	■	■	■	■		■		■	■	■	■
Plain Titmouse	*Parus inornatus*	OV												
Verdin	*Auriparus flaviceps*	YR,n	■	■	■	■	■	■	■	■	■	■	■	■
Bushtit	*Psaltriparus minimus*	YR,n	■	■	■	■	■				■	■	■	■
Cactus Wren	*Campylorhynchus brunneicapillus*	YR,n	■	■	■	■	■	■	■	■	■	■	■	■
Rock Wren	*Salpinctes obsoletus*	YR,n	■	■	■	■	■				■	■	■	■
Canyon Wren	*Catherpes mexicanus*	YR												
Bewick's Wren	*Thryomanes bewickii*	YR,n	■	■	■	■	■	■			■	■	■	■
House Wren	*Troglodytes aedon*	WV	■	■	■	■	■				■	■	■	■
Marsh Wren	*Cistothorus palustris*	WV [b]												
Ruby-crowned Kinglet	*Regulus calendula*	WV	■	■	■	■						■	■	■
Blue-gray Gnatcatcher	*Polioptila caerulea*	WV,n [b]	■	■	■	■						■	■	■
Black-tailed Gnatcatcher	*Polioptila melanura*	YR,n	■	■	■	■	■	■	■	■	■	■	■	■

COMMON NAME	SCIENTIFIC NAME	STATUS [a]	MONTHLY OCCURRENCE J	F	M	A	M	J	J	A	S	O	N	D
Western Bluebird	*Sialia mexicana*	WV	■	□	□	■	□	□	□	□	□	■	■	■
Townsend's Solitaire	*Myadestes townsendi*	WV	■	■	■	■	□	□	□	□	□	□	■	□
Swainson's Thrush	*Catharus ustulatus*	OV	□	□	□	■	■	□	□	□	□	□	□	□
Hermit Thrush	*Catharus guttatus*	OV	□	□	■	□	□	□	□	□	□	□	■	□
American Robin	*Turdus migratorius*	WV	■	■	■	□	□	□	□	□	□	■	□	□
Wrentit	*Chamaea fasciata*	SR,n [b]	□	□	■	■	■	□	■	□	□	■	□	□
Northern Mockingbird	*Mimus polyglottos*	YR,n	■	■	■	□	■	□	□	□	■	■	■	■
California Thrasher	*Toxostoma redivivum*	OV [b]	■	□	□	□	□	□	□	□	□	□	□	□
Cedar Waxwing	*Bombycilla cedrorum*	WV	□	□	■	■	■	□	□	□	□	□	■	□
Phainopepla	*Phainopepla nitens*	YR,n	■	■	■	■	■	■	■	□	■	■	■	■
Loggerhead Shrike	*Lanius ludovicianus*	YR,n	■	□	■	■	■	■	■	■	■	■	■	■
Bell's Vireo	*Vireo bellii*	SR,n [b]	□	□	■	■	■	■	■	□	■	□	□	□
Solitary Vireo	*Vireo solitarius*	OV	□	□	□	□	□	□	□	□	□	□	□	■
Warbling Vireo	*Vireo gilvus*	RM	□	□	■	■	■	□	□	□	■	■	□	□
Orange-crowned Warbler	*Vermivora celata*	RM	□	■	■	■	■	□	□	■	■	■	□	■
Nashville Warbler	*Vermivora ruficapilla*	RM	□	□	■	■	■	□	□	□	■	□	□	□
Yellow Warbler	*Dendroica petechia*	RM	□	□	□	■	■	□	□	□	□	□	□	□
Yellow-rumped Warbler	*Dendroica coronata*	WV	■	■	■	■	□	□	□	□	□	■	■	■
Black-throated Gray Warbler	*Dendroica nigrescens*	RM	□	□	■	■	■	□	□	□	■	■	■	□
Townsend's Warbler	*Dendroica townsendi*	RM	□	□	□	■	■	□	□	□	□	□	■	□
Hermit Warbler	*Dendroica occidentalis*	OV	□	□	□	□	■	□	□	□	□	□	□	□
MacGillivray's Warbler	*Oporornis tolmiei*	OV	□	□	□	□	■	□	□	□	□	□	□	□
Common Yellowthroat	*Geothlypis trichas*	YR,n	■	■	■	■	■	■	■	■	■	■	■	■
Wilson's Warbler	*Wilsonia pusilla*	RM	□	□	■	■	■	□	□	□	■	■	□	□
Yellow-breasted Chat	*Icteria virens*	SR,n [b]	□	□	■	■	■	■	■	■	■	■	□	□
Summer Tanager	*Piranga rubra*	OV	□	□	□	□	■	□	□	□	□	□	□	□
Western Tanager	*Piranga ludoviciana*	RM	□	□	□	■	■	□	□	■	□	■	□	□
Black-headed Grosbeak	*Pheucticus melanocephalus*	RM	□	□	□	■	■	□	□	□	■	□	□	□
Blue Grosbeak	*Guiraca caerulea*	SR,n [b]	□	□	□	■	■	■	■	□	□	□	□	□
Lazuli Bunting	*Passerina amoena*	RM	□	□	□	■	■	□	□	□	□	□	□	□
Green-tailed Towhee	*Pipilo chlorurus*	OV	□	□	□	■	□	□	□	□	□	□	□	□
Rufous-sided Towhee	*Pipilo erythrophthalmus*	WV	■	■	■	■	□	□	□	□	□	□	■	■
California Towhee	*Pipilo crissalis*	YR,n	■	■	■	■	■	■	■	□	□	■	■	■
Rufous-crowned Sparrow	*Aimophila ruficeps*	OV	□	□	□	□	■	□	□	□	□	□	□	□
Chipping Sparrow	*Spizella passerina*	OV	□	□	□	□	□	□	□	□	□	□	■	□
Brewer's Sparrow	*Spizella breweri*	RM	□	□	■	■	□	□	□	□	■	□	□	□
Black-chinned Sparrow	*Spizella atrogularis*	OV	□	□	□	■	■	□	□	□	□	□	□	□
Black-throated Sparrow	*Amphispiza bilineata*	YR,n	■	■	■	■	■	■	■	□	■	■	■	■
Song Sparrow	*Melospiza melodia*	YR,n	□	□	■	■	■	■	■	■	■	■	■	■
Lincoln's Sparrow	*Melospiza lincolnii*	WV	■	■	■	■	□	□	□	□	■	■	■	■
Golden-crowned Sparrow	*Zonotrichia atricapilla*	WV	■	□	□	■	□	□	□	□	□	□	□	■
White-crowned Sparrow	*Zonotrichia leucophrys*	WV	■	■	■	■	■	□	□	□	■	■	■	■
Dark-eyed Junco	*Junco hyemalis*	WV	□	□	■	□	□	□	□	□	■	■	■	■
Brown-headed Cowbird	*Molothrus ater*	SR,n [b]	□	□	□	■	■	■	■	□	□	□	□	□
Hooded Oriole	*Icterus cucullatus*	SR,n [b]	□	□	■	■	■	■	■	□	□	□	□	□
Northern Oriole	*Icterus galbula*	RM	□	□	□	■	■	■	□	□	□	□	□	□
Scott's Oriole	*Icterus parisorum*	SR,n [b]	□	□	■	■	■	■	■	□	□	□	■	□
Purple Finch	*Carpodacus purpureus*	WV	■	□	□	□	□	□	□	□	□	■	□	■
House Finch	*Carpodacus mexicanus*	YR,n	■	■	■	■	■	■	■	■	■	■	■	■
Pine Siskin	*Carduelis pinus*	WV	□	□	□	□	■	□	□	□	□	□	■	□
Lesser Goldfinch	*Carduelis psaltria*	YR,n [c]	■	■	■	■	■	■	□	□	■	■	■	■
Lawrence's Goldfinch	*Carduelis lawrencei*	RM	□	□	■	■	■	□	□	□	□	□	□	□

[a]YR, year round; SR, summer resident; RM, regular migrant; WV, winter visitor; OV, occasional visitor (species seen 1–3 times); n, nesting confirmed. Assessment refers to status in study area only.

[b]Status discussed in species account.

[c]Nesting confirmed by P. Unitt (pers. comm.).

(4.24 in.), standard deviation 3.15]. The seasonal pattern of rainfall was typically bimodal, consisting of a winter rainy period (October to March) and a lesser summer peak (August).

Although drought prevailed most of the eight years, Vallecito Creek flowed vigorously throughout the census period. In the lower canyon, the stream changed course three times after severe winter storms. The first time was just prior to this study, judging from the lack of vegetation along the lower third of the stream when we began our census. In early 1986 and again in 1991 storms altered the streambed in several places. After each change of course, the new streambed was colonized swiftly by Salt Cedar, Cocklebur, Wild Celery, and Watercress, choking it with vegetation within a year. In 1985 there were no willows to be seen along the creek. By 1989 two small clusters had grown tall enough to be visible above the mesquite thickets; by 1992 there were five willow stands, one of which is shown in Figure 2.

Our counts began in March 1985 and continued through December 1992. Table 1 shows the number of counts per month and per year throughout the study. Through 1989 they were made approximately once a month from September through May, with none in the summer months. In 1990 we began more frequent counts during spring migration and the breeding season and extended the count period into June or July. All counts were made in the early morning, starting about 0.5 hr after daylight and ending 1.5–2.5 hr later. We began at the lower end of the creek where it sinks into the sand and followed the stream up into the gorge about 2.0 km (1.2 mi) until the terrain became impassably steep. We patterned our technique after breeding-bird surveys (van Velzen 1972), recording all birds seen and heard. During the breeding season in 1991 and 1992 we recorded our observations by six subsegments, in order to pinpoint the locations of breeding birds and estimate the number of pairs whenever possible.

We located only a few nests, as the preferred habitat for many species was in the dense mesquite thickets of the creekbed where searching was virtually impossible. More often we used territorial behavior (singing and/or displays), the carrying of nesting material, and/or feeding offspring as evidence of nesting.

We have included data from a few other sources. In 1986 the creek was included in a census of Bell's Vireos breeding in the Anza–Borrego Desert (Wier and Jones 1986), and from 1989 on it has been surveyed each spring for this species (K. Pluff pers. comm.). Philip Unitt (pers. comm.) occasionally visited the upper end of the canyon, at the east end of Mason Valley and just west of our study site; we have cited some of his observations.

RESULTS

One hundred and five species were seen during the study; their status and monthly occurrence are shown in Table 2. The number of species per count ranged from 11 (30 Aug 1992) to 37 (30 Apr 1988); the number of birds seen on any one count ranged from 20 (30 Aug 92) to 274 (8 Apr 86). The mean number of species and individuals per month is shown in Table 1.

Highest counts of both species and individuals were from March to May when spring migrants and summer visitors joined the year-round residents. The lowest number of both species and individuals was on the single count done in August.

Table 3 shows the relative abundance of 15 species seen regularly throughout the census. The most abundant species was the House Finch, seen on 101 of the 109 counts with a range of 2–65 individuals per count; highest numbers were recorded in 1985–86. The California Quail was the second most abundant species, seen on 71 counts in numbers ranging from 1 to 65; Lesser Goldfinches were seen on 66 of 109 counts, with 2–50 individuals per count. Annual variation was frequent, even where populations were small (Phainopepla, Mourning Dove, Black-throated Sparrow). Species with the most stable populations were the Black-tailed Gnatcatcher, Cactus Wren, Rock Wren, California Towhee and White-winged Dove, all of which resided in very small numbers along the creek.

Year-Round Residents

Many of the 27 year-round residents are common to the coastal slope as well as to the desert; only a few are strictly desert species (see Discussion). For 22 of the 27 year-round residents we found evidence of nesting in the study area (Table 4); all have been previously documented as breeding in the Anza–Borrego Desert (Unitt 1984). We were able to estimate the number of breeding pairs for many species, but some defied counting (Table 4). Three species that are known residents and were sighted regularly gave no indication of nesting along this section of the creek (Black Phoebe, Say's Phoebe, Canyon Wren). Suitable habitat was probably lacking for all but the Canyon Wren, which may have nested and been missed by us. An active Red-tailed Hawk nest was seen in a side canyon northeast of the creek in

Table 3 Mean Number per Year of Most Common Year-Round Residents at Vallecito Creek in Order of Total Abundance

Species	1985	1986	1987	1988	1989	1990	1991	1992	All years
House Finch	19.5	22.5	7.8	17.0	10.9	15.3	13.7	11.1	14.7
California Quail	2.9	5.3	5.0	6.4	24.0	7.3	10.6	12.8	9.9
Lesser Goldfinch	14.8	16.0	2.8	10.0	2.9	1.4	5.6	4.8	6.8
Phainopepla	4.6	4.2	2.0	5.5	3.1	7.1	9.3	3.7	5.0
Verdin	3.3	6.3	5.1	4.4	5.1	6.1	2.8	3.9	4.5
Mourning Dove	2.6	5.5	1.7	3.0	1.5	1.9	7.5	8.1	4.4
Song Sparrow	1.6	1.9	2.1	4.4	3.6	4.9	4.2	4.0	3.8
Costa's Hummingbird	3.1	3.3	1.6	2.2	3.9	4.4	4.0	5.9	3.7
Black-tailed Gnatcatcher	2.9	3.5	3.4	3.9	4.8	3.9	3.4	3.9	3.7
Cactus Wren	3.5	3.3	2.7	3.2	1.1	1.2	2.5	3.9	2.5
Rock Wren	2.9	2.1	2.5	1.8	1.6	2.1	2.0	1.6	2.0
Black-throated Sparrow	3.0	2.7	3.8	1.0	1.8	10.1	2.6	2.1	2.0
Bewick's Wren	5.5	2.4	2.2	1.6	1.6	0.6	1.0	2.0	1.9
California Towhee	1.7	1.9	1.3	0.5	1.3	1.8	2.0	1.9	1.6
White-winged Dove	0.8	1.2	0.8	1.5	1.3	1.7	2.1	1.7	1.5

Table 4 Estimated Numbers of Species Nesting at Vallecito Creek

Species	Status[a]	Number of pairs[b]
California Quail	YR	?
White-winged Dove	YR	3–5
Mourning Dove	YR	?
Greater Roadrunner	YR	?
Lesser Nighthawk	SR	1
Anna's Hummingbird	YR	?
Costa's Hummingbird	YR	?
Ladder-backed Woodpecker	YR	1–2
Ash-throated Flycatcher	SR	3
Verdin	YR	5–6
Cactus Wren	YR	5
Bushtit	YR	1–2
Bewick's Wren	YR	5–6
Rock Wren	YR	3
Blue-gray Gnatcatcher[c]	WV	1
Black-tailed Gnatcatcher	YR	3–4
Wrentit	SR	1
Northern Mockingbird	YR	2–3
Phainopepla	YR	7–8
Loggerhead Shrike	YR	1–2
Bell's Vireo	SR	1–4
Common Yellowthroat	YR	3–4
Yellow-breasted Chat	SR	4–7
Blue Grosbeak	SR	2–4
California Towhee	YR	3–4
Black-throated Sparrow	YR	?
Song Sparrow	YR	5–6
Brown-headed Cowbird	SR	?
Hooded Oriole	SR	2
Scott's Oriole	SR	2–3
House Finch	YR	5–6
Lesser Goldfinch	YR	?

[a]YR, Year-round resident; WV, winter visitor; SR, summer resident.
[b]Estimated over the period of the study in which the species nested; not all species nested every year.
[c]See species account.

1991 (R. Theriault pers. comm.), and Common Ravens nested in 1984, at least, farther up the gorge where the creek has carved bluffs out of alluvium in the east end of Mason Valley (P. Unitt pers. comm.).

Summer Residents

Migratory species that bred in the canyon arrived in late March or early April and generally remained into September. Estimated numbers of breeding pairs are shown in Table 4. Most winter regularly in Mexico and Central

America. Scott's Oriole winters as far north as the southern Anza–Borrego Desert (see species account below). The Wrentit is a chaparral bird that is common on montane slopes less than 8 km (5 mi) south and west, and for which Vallecito Creek is marginal habitat at the eastern limit of its range. In the Anza–Borrego Desert it is resident in the chaparral–desert edge habitat of Culp Valley in the San Ysidro Mountains 24 km (15 mi.) north of our site (M. Gabel pers. comm.) but was heard in our study area only from the breeding season (March) to October.

Regular Migrants

Spring migration began in February with Orange-crowned Warblers moving north, but most species arrived in late March or April (Table 2). Willow Flycatchers made a late appearance in May, as they do on the coast (Unitt 1984). Our study did not adequately document fall migration, as we generally resumed counts in late September afer a summer hiatus. Late August/early September are reportedly the peak period for fall migration in the desert (K. Garrett, P. Unitt, pers. comm.).

Winter Visitors

Patterns of winter use varied (Table 2). A few species were regular winter residents: Ruby-crowned Kinglet, Blue-gray Gnatcatcher, Lincoln's Sparrow, and White-crowned Sparrow, only the last occurring in large numbers. Most were intermittent visitors, sometimes staying for a month but usually appearing sporadically.

Occasional Visitors

Twenty-nine species were seen only one to three times, as follows: Snowy Egret, 27 May 1990; Green-winged Teal, 27 Feb 1988; Cinnamon Teal, 5 Mar 1988; Turkey Vulture, 5 Mar 1988, 10 Mar 1990, 7 Apr 1991; Northern Harrier, 14 Nov 1992; American Kestrel, 3 Sep 1989; Sora, 8 Apr 1986, 27 Feb 1988, 5 Mar 1988; Great Horned Owl, 20 Sep 1985, White-throated Swift, 3 Jun 1989; Allen's Hummingbird, 25 and 29 Mar 1989; Red-breasted Sapsucker, 14 Oct 1990; Olive-sided Flycatcher, 27 May 1990; Hammond's Flycatcher, 20 Sep 1985; Vermilion Flycatcher, 28 Dec 1989; Tree Swallow, 15 Oct 1989, 11 Apr 1991, 11 May 1991; Barn Swallow, 30 Apr 1988, 29 Mar 1989; Scrub Jay, 15 Dec 1990; Plain Titmouse, 30 Nov 1987, 27 Feb 1988, 25 Feb 1991; Swainson's Thrush, 11 Apr, 11 May, and 19 May 1991; Hermit Thrush, 25 Mar 1987, 2 Nov 1989, 18 Nov 1990; California Thrasher, 2 Jan 1989; Solitary Vireo, 17 Dec 1986; MacGillivray's Warbler, 11 May 1991; Hermit Warbler, 1 May 1990; Summer Tanager, 23 May 1987, 19 May 1991; Green-tailed Towhee, 8 Apr 1986; Rufous-crowned Sparrow, 23 May 1987; Chipping Sparrow, 7 Nov 1987; Black-chinned Sparrow, 1 Apr 1985, 24 May 1992.

Several species known to reside year-round in the Anza–Borrego Desert (Great Horned Owl, White-throated Swift, California Thrasher) we saw only rarely in our study area. Philip Unitt (pers. comm.) noted three species not seen by us: Barn Owl (*Tyto alba*), 4 on 11 Oct 1983, 3 on 2 Sep 1984, 1

on 6 Oct 1984; Violet-green Swallow (*Tachycineta thalassina*), 2 on 2 Sep 1984; Northern Waterthrush (*Seiurus noveboracensis*), 1 on 2 Sep 1984.

Species Accounts

Species for which new information on occurrence or nesting has resulted from our data, or needing consideration in greater depth, are discussed below.

Sora. We heard the Sora only three times and only in winter (Table 2) and have called it an occasional visitor. Although less frequently heard than the Virginia Rail, it may be a more regular visitor at the upper end of the canyon than our data reveal, as P. Unitt (pers. comm.) noted it there on 11 Oct 1983 and 2 Sep 1984.

Great Horned Owl. An uncommon resident of the western Colorado Desert, this owl was seen in the study area only once by us and once by P. Unitt (2 May 1992). No breeding habitat suitable for this species exists along the creek.

Lesser Nighthawk. The nighthawk breeds in the eastern Colorado Desert, most abundantly in the Salton Sea and Colorado River regions (Garrett and Dunn 1981), but in the Anza–Borrego Desert there is very little documentation of its nesting. Moderate numbers apparently breed in the mesquite bosque of Borrego Valley (A. Morley, pers. comm.) but not in other similar habitats such as Clark Dry Lake (M. Gabel pers. comm.) or Hawk Canyon (Evans pers. obs.). A pair bred in a side canyon at the south end of our study area in 1989, 1991, and 1992. On 1 Jul 1991 they engaged in distraction displays in response to our presence, indicating they had young. They were still present in September when the surveys resumed, but not from October to February.

White-throated Swift. A resident in Hawk Canyon and at other sites in the Anza–Borrego Desert where there are steep-walled canyons that provide crevices for roosting, the swift was seen only once over our study area.

Costa's Hummingbird. Abundant from December to June in many areas of the desert, this species' numbers are much diminished in summer and autumn. However, some birds are found all year in the southern and southeastern desert areas of San Bernardino, Riverside and Imperial counties (Baltosser 1989), and one or two individuals were present on many of our counts from September to November, evidence that some individuals remain through their nonbreeding season. In Borrego Springs, Costa's Hummingbirds are present year round where there are irrigated gardens with blooming plants and dependable feeding stations (A. Morley pers. comm.). We have seen the species in all months except August, and thus consider it a year-round resident. The population is much augmented in December, and large numbers have been seen on recent Anza–Borrego Desert Christmas Counts (82 in 1990, 80 in 1991). Breeding starts in December; display flights were seen by us on 28 Dec 1985 and 17 Dec 1986.

Vermilion Flycatcher. Although seen only once in our study area, Vermilion Flycatchers nested at Butterfield Ranch RV Park about 5 km (3 mi.) west of the study area in 1984 (*American Birds* 38:1062, 1984) and probably since. They are seen occasionally on Christmas Counts in Borrego Valley.

Ash-throated Flycatcher. This species was seen during spring migration 1985–1989 but we did not do enough counts in May and June to document nesting. From 1990 on, two to six individuals remained throughout the breeding season. From their spacing along the creek we estimated three breeding pairs.

Marsh Wren. One or two Marsh Wrens were present in the winter months (Oct–Mar) until 12 Mar 1989, but we have not noted them since.

California Thrasher. Primarily a resident of chaparral, this species finds its eastern limit at the western edge of the desert, where it is uncommon (Garrett and Dunn 1981, Unitt 1984). Although we saw it only once in the study area, P. Unitt (pers. comm.) has noted it along the upper portion of the creek fairly regularly.

Blue-gray Gnatcatcher. The species was present during the winter from October to April. On 1 Apr 1985 we observed a pair building a nest in an *Atriplex* shrub on the edge of the creek; on the next visit a week later the nest was completed but abandoned. We have classified the Blue-gray Gnatcatcher as a wintering bird, as it nests at our site and elsewhere in the Anza–Borrego Desert only sporadically. There have been no sightings in the study area in late spring or summer.

Wrentit. We first heard a Wrentit on 7 Apr 1991; it was singing steadily on the desert slope on the north side of the gorge. It was present on subsequent visits until July and so we presume it nested; we heard it again in October. One was in the same location in the spring of 1992. Desert vegetation covers the slope, including agave, ocotillo, barrel and cholla cacti, uncommon habitat for a chaparral bird.

Bell's Vireo. A singing male was first heard on 28 Mar 1988, and shortly another male established a territory farther up the creek. The species has bred every subsequent year, with one pair in 1989, four in 1990, one in 1991, and four in 1992. The rapid and dense growth of mesquite, Mulefat (*Baccharis salicifolia*), and willows along the creek have created excellent breeding habitat for the vireo. Additional pairs were found on all surveys in Vallecito Wash, up the canyon beyond the study area (K. Pluff pers. comm.).

Yellow-breasted Chat. On 30 Apr 1988, three chats were vocalizing in three discrete locations along the creek, and by May there were apparently four pairs in residence. In subsequent years the number of territorial males was four in 1989, three in 1990, seven in 1991, and one in 1992. Chats are obligate riparian breeders, in southern California being found mostly in the coastal lowlands. While migrants have been observed in the Anza–Borrego Desert, there has been no previous confirmation of them as a summer resident there away from Coyote Creek, 52 km (32 mi.) to the north (Unitt 1984).

Blue Grosbeak. Although Blue Grosbeaks were seen during spring migration in 1986 and 1987, we were not certain of nesting until 1989 when several pairs were present throughout May. In subsequent seasons two to four pairs bred along the creek, and juveniles were present in early July. The species' breeding in the Anza–Borrego Desert has not been previously confirmed (Unitt 1984).

Brown-headed Cowbird. Cowbirds are residents of the Anza–Borrego Desert but occurred in our study area during the breeding season only and are listed as a summer resident in Table 2. They were present from April to June, with one to five individuals seen on any one visit. To protect Bell's Vireos from parasitism, in 1991 Anza–Borrego Desert State Park personnel began trapping cowbirds in Vallecito County Park approximately 8 km (15 mi.) southeast. Many cowbirds were caught, but their numbers on our counts did not change. A pair of Black-tailed Gnatcatchers was observed feeding a cowbird chick on 21 May 1988.

Hooded Oriole. Although Hooded Orioles prefer to nest in palm trees or tall cottonwoods, neither of which is found in the study area, we have strong evidence that they nested in 1991 and 1992. Before 1991, they had been seen early in April but not in May or later. In 1991 one to three birds were present until early July. always in the same two locations in dense mesquite thickets. In 1992 from one to five birds were seen in April and May; on 24 May an adult male and two juveniles were seen foraging in a Desert Willow. We estimate two breeding pairs.

Scott's Oriole. The first sighting in our records was of a male on 3 June 1989, the only sighting for the year. In 1990 a male was heard on 25 March; by mid-April there were two pairs present; on 7 July 3 birds were seen. In 1991 one to four birds were seen from March through July, and one was present in November. In 1992 two or three pairs nested, and six individuals were seen in early September. Migratory patterns of Scott's Orioles are not well understood (Unitt 1984), but there is some overwintering in Borrego Valley, as a few are regularly seen on Christmas Counts. They also winter in the lower desert, where five were seen on 31 December 1992 on the loop trail out of Mountain Palm Springs about 32 km (20 mi.) southeast of the study area (Massey pers. obs.). Small numbers (up to 7 in 1992–1993) have been seen regularly in winter in Ocotillo, Imperial Co., approximately 48 km (30 mi.) southeast (K. Garrett, S. von Wehrlhoff, pers. comm.).

DISCUSSION

Many permanent residents showed fairly wide fluctuations in numbers over the 8 years of the study (Table 3). House Finches and Lesser Goldfinches were much more abundant in 1985–1986 than from 1987 on. California Quail numbers jumped fourfold in 1989. Mourning Doves were most abundant in 1991–92, Phainopeplas in 1990–1991, Black-throated Sparrows in 1990. These fluctuations reflect the cyclic nature of breeding success; good years for some species were poor years for others.

Before 1988 we saw little evidence of breeding by migratory birds. Recovery and new growth of the vegetation following flooding in the winter of 1984–1985 apparently reached a critical level that year. Since then the migratory breeding-bird population has increased almost yearly, in terms of both species and number of individuals.

We found Northern Mockingbirds and Loggerhead Shrikes to be remarkably quiet. The song of the mockingbird was almost never heard, only the call notes; the shrikes rarely vocalized at all. A plausible explanation is that the resident population of each species is so small (1–3 pairs) that the need for territorial behavior is diminished; at other desert sites with larger populations (e.g., Clark Dry Lake) we have found them much more vocal.

Vallecito Creek has both the climate and the vegetation of a desert riparian community, but its location on the western edge of the desert has strongly influenced its avifaunal composition. Many year-round residents are species found predominantly along the coastal slope or in chaparral (e.g., California Quail, Bushtit, Bewick's Wren, California Towhee, Song Sparrow). Several species are at the eastern limit of their breeding range at this location (California Quail, Wrentit, California Towhee). Only a few species are considered strictly desert denizens (White-winged Dove, Ladder-backed Woodpecker, Verdin, Black-tailed Gnatcatcher, Black-throated Sparrow, and Scott's Oriole). Many occasional and winter visitors are coastal species whose preferred habitat is only a few miles away (Scrub Jay, Plain Titmouse, Rufous-sided Towhee, Rufous-crowned Sparrow, Purple Finch) and are exhibiting short-distance dispersal. The avian inhabitants of the Vallecito Creek riparian woodlands are thus predominantly extensions of coastal populations.

SUMMARY

From 1985 to 1992 we censused birds along Vallecito Creek, a riparian woodland between Mason and Vallecito valleys, Anza–Borrego Desert, San Diego County, California. The creek flowed vigorously through this period despite the concurrent drought. It changed course just before the initiation of the study and several times during the study period as a result of winter storms. Proliferation of vegetation along new stream courses was paralleled by increases in variety and numbers of breeding birds. The 105 species recorded encompassed 27 permanent residents and 9 summer residents. Although the site lies in the desert, its location makes it the eastern margin of the range of several coastal species, and its avifauna in general consists of extensions of coastal populations. Only six species are considered restrictedly desert species.

ACKNOWLEDGMENTS

We thank Pat Flanagan and Nancy Whalen for assistance on counts and Art Morley, Robert Theriault, and Mel Gabel for information on species occurrence at other sites in the Anza–Borrego Desert. Karen Pluff provided data on Least Bell's Vireos breeding along the creek, and Philip Unitt contributed information on occasional avian visitors not seen by us. In particular we would like to thank Kimball Garrett and Philip Unitt for their careful review of the manuscript and their many excellent suggestions for improving it.

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CURRENT STATUS OF THE FIVE-STRIPED SPARROW IN ARIZONA

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Although the Five-striped Sparrow (*Aimophila quinquestriata*) is not uncommon in appropriate habitat in northern and western Mexico, and has occurred regularly in summer in southeastern Arizona since 1969, not much is known about its movements or true numbers. The A.O.U. (1983) called the species a "resident from southeastern Arizona south through eastern Sonora and western Chihuahua to central Sinaloa and western Durango; also in Jalisco," implying the species is nonmigratory. In southeastern Arizona only a few individuals have been found in winter (Snider 1969, Stotz 1978, Mills et al. 1980, Mills 1989, 1992). From museum specimen records, Phillips and Phillips (1993) deduced that the species migrates seasonally north–south.

In 1977 and 1978, during a life-history study of the Five-striped Sparrow near Patagonia, Arizona, an intensive search of several other canyons revealed the species in four canyons in the Pajarito Mountains (Sycamore, Tonto, Holden, and California Gulch) and in Chino Canyon in the Santa Rita Mountains (Mills "1977"). Interestingly, more males were found after July than before (Mills et al. 1980).

After 1978, my yearly casual monitoring and reports from birders suggested that the numbers of Five-striped Sparrows had declined in some canyons, and by 1985 the species no longer occurred in two of the six canyons (Chino Canyon and Patagonia) where Mills ("1977") had reported them. In this paper I report the results of my surveys during the 1990–1992 breeding seasons. The purposes of the surveys were to determine the population status of the Five-striped Sparrow in Arizona almost 15 years after the initial intensive survey, to determine whether the midsummer influx of males during 1977 and 1978 was typical, and to determine whether males moved from canyon to canyon.

METHODS

Using the same technique to locate males that I had used during 1977 and 1978, I surveyed Chino Canyon, in the Mt. Wrightson Wilderness Area of the Santa Rita Mountains, east of Amado, and Sycamore Canyon, Tonto Canyon, Holden Canyon, and California Gulch, all in the Pajarito Mountains south of Ruby (Figure 1). Sycamore Canyon and the western part of Tonto Canyon are within the Pajarito Wilderness Area. Five-striped Sparrow habitat diminishes near the U. S./Mexico border, so I did not survey south of the border, nor did I survey the canyon located on private property near Patagonia because no Five-striped Sparrows have been found there for several years. I surveyed each canyon once each June and August 1990, 1991, and 1992, except Holden Canyon was not surveyed in August 1990, because of unsafe conditions, and Tonto Canyon was not surveyed in June 1991. I did not search for the inconspicuous females.

In 1990 I played taped songs and calls of a male Five-striped Sparrow I recorded in July 1978 near Patagonia; in 1991 and 1992 I played songs and calls of a male Five-striped Sparrow recorded at California Gulch (Keller 1988). I broadcast songs and calls intermittently on a Panasonic RQ-355 cassette tape recorder at previously known sites and in other suitable habitat.

In 1991 and 1992 I attempted to capture Five-striped Sparrows in mist nets, decoying them with more broadcast song and a plastic dummy Five-striped Sparrow. I determined the sex of captured birds by their singing and the size of their cloacal protuberance, and I aged them by plumage color (Wolf 1977). I banded them with U. S. Fish and Wildlife Service aluminum bands and colored plastic bands in unique combinations for individual identification. I marked each male's location on a U. S. Geological Survey topographic map. Previous studies have shown that Five-striped Sparrow territories are arranged linearly within a canyon, no territory is above another territory, and boundaries are defined by topographic features such as ridges (Mills et al. 1980). Previously banded birds found in later surveys were not recaptured but were identified and their location was marked on a map.

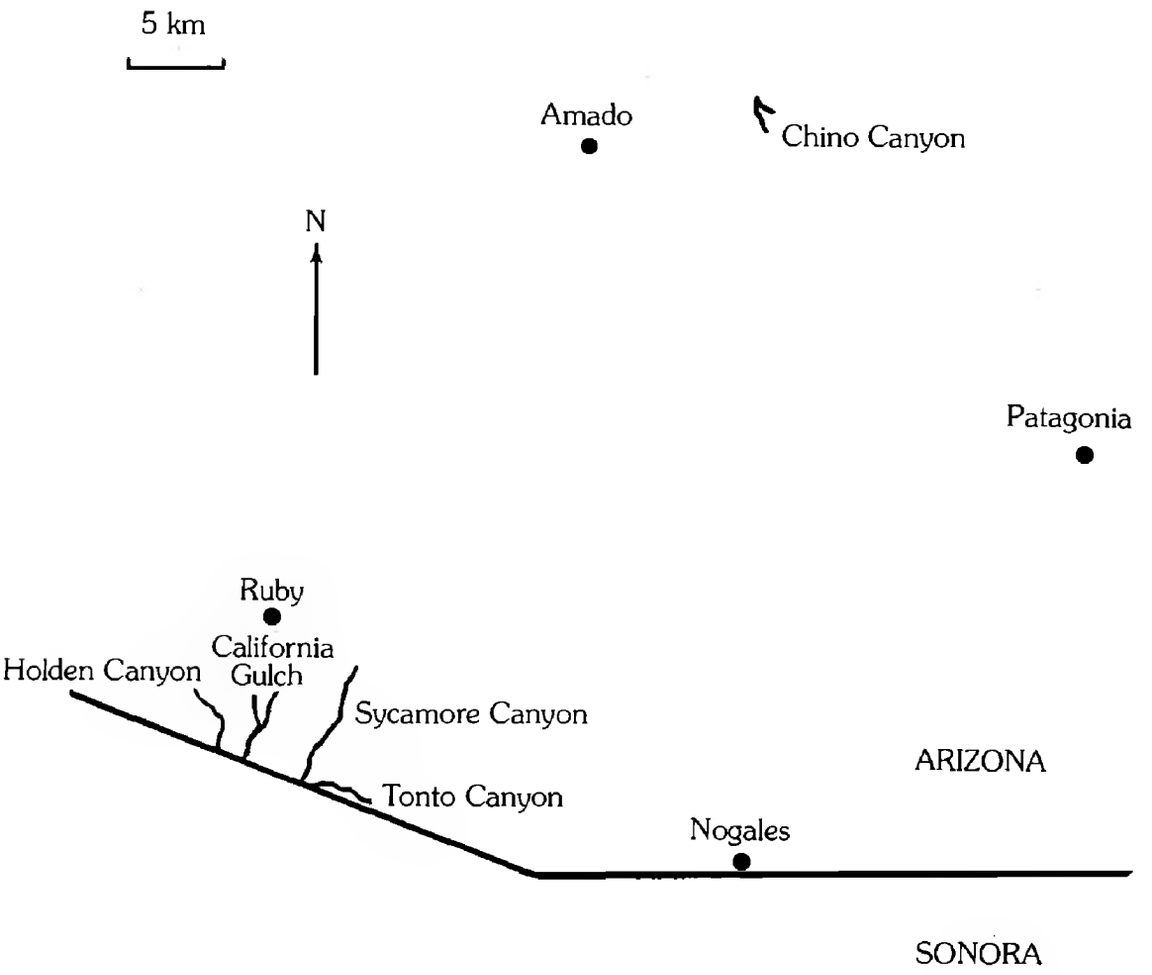

Figure 1. Arizona sites searched for Five-striped Sparrows, 1990-1992. Circles, reference localities.

RESULTS

The 1990 survey of unbanded males in the five canyons showed that total numbers of Five-striped Sparrows had declined since 1978, primarily because of the species' disappearance from Chino Canyon and a substantial decrease in numbers at Tonto Canyon and California Gulch. In Sycamore and Holden canyons, however, the number of males had changed little since 1978–1979. In August the number of males found in Sycamore Canyon was over twice that found in June, at California Gulch one more male was found, and in Tonto Canyon the same number was found (Table 1). At none of the canyons was there a decrease in males from June to August, suggesting that the change in numbers wasn't due to local interpopulation dispersal.

The 1991 and 1992 surveys with uniquely banded birds provided more accurate information about population size and movements of individuals (Table 2). Except in Chino Canyon, the numbers of male Five-striped Sparrows in each canyon were close to those found during the 1977–78 surveys and higher than in 1990. The total number of birds observed in all canyons in both 1991 and 1992 was higher than the total number of birds observed in any individual survey, either June or August.

In 1991, in the three canyons for which I have relevant data, the number of males decreased, not increased, from June to August. The appearance in August of unbanded birds, however, demonstrated that an influx of males did occur, though offset by the disappearance of banded birds. In 1992 the midseason influx almost equaled the efflux.

This mid-seasonal movement and the decrease in numbers between June and August 1991 may be attributable to lack of rainfall; summer monsoons trigger breeding (Mills et al. 1980). Dependency on rainfall and "nomadic reproduction" is known in other *Aimophila* sparrows, e.g., the Rufous-winged (*A. carpalis*), and Cassin's (*A. cassinii*) (Marshall 1963, Short 1974). In 1991, I found only two pairs of birds with fledged young, and

Table 1 Locations and Numbers of Unbanded Male Five-striped Sparrows in Arizona in 1977, 1978, and 1990

Location	1977[a]	1978[a]		1990	
	July/August	June	July/August	June	August
Sycamore Canyon	12	5–6	15	7	16
Tonto Canyon	12	—[b]	4[c]	6	6
California Gulch	9	—[b]	7	3	4
Holden Canyon	7	3–4	8	8	—[b]
Chino Canyon	2	1–6	12	0	0
Total	42	9–16	46	24	26

[a]Data from Mills et al. (1980).
[b]Canyon not surveyed.
[c]Canyon incompletely surveyed.

Table 2 Locations and Numbers of Male Five-striped Sparrows in Arizona in 1991 and 1992

	1991		1992			
	June	August	June	August	Total 1991	Total 1992
Sycamore Canyon	13	9	17	11	16	24
Tonto Canyon	—[a]	8	8	7	8	8
California Gulch	10	8	7	7	12	11
Holden Canyon	9	6	5	11	11	11
Chino Canyon	0	0	0	0	0	0
Total, all canyons	32	31	37	36	47	54

[a]Canyon not surveyed.

their calculated date of conception (Mills et al. 1980) coincided with the first heavy rainfall on 25 July (local resident, pers. comm.). I observed no pairs building nests, no males were singing spontaneously, and the birds I caught in August were already in the late stages of postnuptial molt. In other years, Five-striped Sparrows have nested up to three times, into late August and September (Wolf 1977, Mills et al. 1980). Failure to breed in 1991 is also indicated by the ages of males I banded in 1992. Bellies of Five-striped Sparrows in juvenal or first basic plumage are yellowish, whereas those in later plumages lack yellow (Wolf 1977). In 1991, 11 of 37 males captured had yellow, whereas 0 of 26 caught in 1992 had yellow. Therefore, no first-year males representing the previous summer's hatch were found in 1992.

Banding revealed that very few birds returned in 1992 to the same canyon and territory where they were captured in 1991, yet total population numbers changed little between 1991 and 1992 (Table 2). Of 37 males banded in 1991, only 10 were resighted in 1992 and only 4 of these were in territories they had occupied in 1991 (Table 3). The fate of the missing 27 males and the source of immigrating males are unknown. Within a season, most males remained in the territory where they were banded, only

Table 3 Resightings in 1992 of Male Five-striped Sparrows Banded in Arizona in 1991

	Canyon			
	Sycamore	Tonto	California	Holden
Banded in 1991	15	4	10	8
Resighted in 1992	3	1	4	2
Resighted in 1992 on territory where banded in 1991	1	0	1	2

a few switching territories within a year or from one year to the next. This shifting of territories has been reported previously; it may be related to breeding failure and mate-switching (Mills et al. 1980).

The banding study implies that Five-striped Sparrows move mid-seasonally to and from their Arizona range. However, no banded bird was found away from the canyon where it had been banded. This apparent isolation from each other of the populations in various canyons is remarkable, considering their proximity and the discovery that Five-striped Sparrows in Mexico are not as sedentary as was once thought (Phillips and Phillips 1993).

SUMMARY

Five-striped Sparrows have occupied territories in Sycamore Canyon, Tonto Canyon, Holden Canyon, and California Gulch, Santa Cruz Co., Arizona, since their discovery in 1977, but the species has disappeared from Chino Canyon and Patagonia. In 1991 and 1992, and especially between the two years, there was substantial turnover of individual birds, so earlier counts may have underestimated the total number of birds found in each canyon per season. Yet within a canyon very few birds switched territories, either within or between breeding seasons. I observed no intercanyon movement by banded birds.

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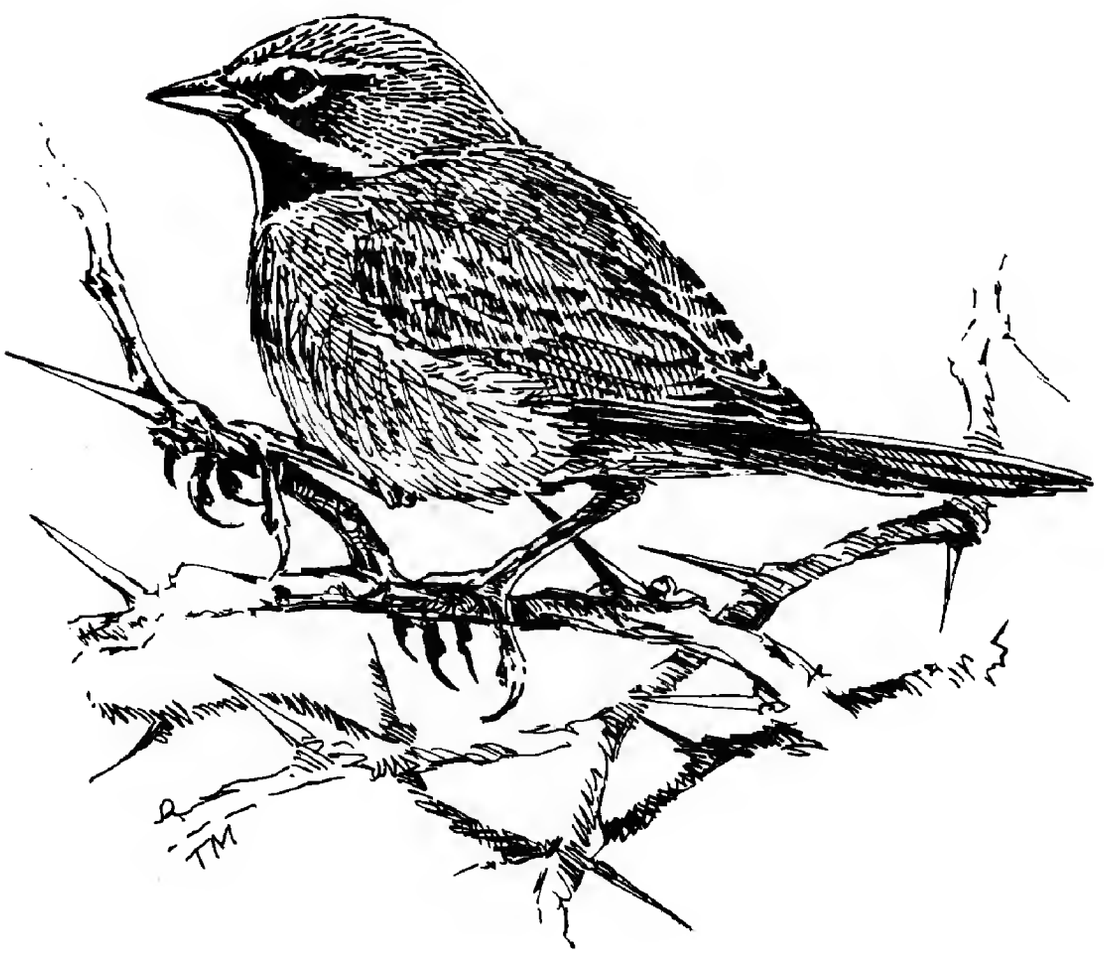

Five-striped Sparrow *Sketch by Tim Manolis*

NOTES

A WHITE GREEN HERON IN SOUTHERN CALIFORNIA

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Albinism, leucism, and other patterns of pigment reduction are widespread among birds, with examples having been documented for 50 avian families in North America alone, representing well over 245 species (Ross 1963). Recurring pigment reduction within populations may have interesting behavioral and evolutionary implications (Graves 1992, Holyoak 1978), but most publications documenting albinism and leucism seek simply to add to a growing registry of affected species. Of more direct concern to the field ornithologist are cases in which albinistic individuals resemble other species, confusing species-level identification (Garrett 1990). Here I report a leucistic or "partial albino" Green Heron (*Butorides virescens*) at Malibu Lagoon, Los Angeles County, California, and discuss implications of this unusual plumage for species identification. A review of Palmer (1962), Ross (1963), Hancock and Elliott (1978), Cramp and Simmons (1977), Brown et al. (1982), and Marchant and Higgins (1990) revealed no previous records of albinism or leucism in the *Butorides striatus* species complex, within which *B. virescens* is again considered specifically distinct (Monroe and Browning 1992, AOU 1993). I did not undertake an exhaustive search of regional literature.

I discovered the unusual heron at this small coastal estuary on 15 August 1992; seven normally plumaged Green Herons were present at the lagoon the same day. Kiff and Nakamura (1979) considered this species a "common resident" there. Hal Spear observed and photographed (Figure 1) the bird the same day. In size, shape, and behavior the bird was a typical *Butorides*; it was not heard to call. Its plumage was entirely pure white except for an inconspicuous line of dark feathering on the forecrown, extending back just posterior to the eye. The following bare-part and soft-part colors were recorded in the field: bill bright yellow basally and somewhat duller yellow distally, with dusky along the culmen and at the base of the maxilla; eyes bright yellow; a patch of bright green skin between the eye and the bill; legs bright yellow-green.

Many species of herons and egrets are essentially pure white in plumage, either in all plumages (Great Egret, *Casmerodius albus*; many species of *Egretta*), as immatures (Little Blue Heron, *Egretta caerulea*), in basic plumage (Cattle Egret, *Bubulcus ibis*), or as one particular morph (e.g., Reddish Egret, *E. rufescens*). Apart from the inconspicuous area of dark feathering on the forecrown, the Malibu Lagoon heron matched the pure white plumage of other local white small herons (Snowy and Cattle Egrets) and could easily have been dismissed as one of those species. Bare-part colors vary notably with age and season within the Ardeidae (Hancock and Kushlan 1984, Palmer 1962, McVaugh 1972) and must be used cautiously for species identification. However, the bare part colors of the Malibu Lagoon heron, as described above, fall outside the range of the Snowy or Cattle Egret or any local ardeid besides *Butorides*. The extensive yellow on the bill may suggest a hatching-year bird or be the result of the unusual melanin reduction. The bird's shape, including the relatively large bill, short legs, and hunched posture were the most

Figure 1. White Green Heron (*Butorides virescens*) at Malibu Lagoon, Los Angeles County, California, 15 August 1992.

Photos by Hal Spear

obvious factors confirming its identification as a Green Heron. The foraging behavior, slow stalking and motionless prey-searching at the water's edge or in very shallow water, was also typical for this species.

I thank Nancy Spear for additional information on this sighting and for permission to publish the photographs. The photographs were cheerfully obtained, at my request, by the late Hal Spear. Hal's contributions to field ornithology and bird conservation in the Los Angeles area were many, and he is missed; this note is dedicated to his memory.

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MORE RECORDS OF BREEDING BIRDS FROM MONTAGUE ISLAND, NORTHERN GULF OF CALIFORNIA

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Palacios and Mellink (1992, 1993) have reported on the breeding birds of Isla Montague, northern Gulf of California. Here we report additional breeding species detected during the 1993 breeding season.

Black Skimmer (*Rynchops niger*). Black Skimmers are locally common year-round in northwestern Baja California and are increasing their numbers on the peninsula (Palacios and Alfaro 1992). There are no previous confirmed nesting records for the northern Gulf of California, although Palacios and Mellink (1993) suspected their nesting on Montague. On 20 May 1993 we found a breeding colony of 14 nests with 33 eggs. The colony was about 1 km east of the main channel of the Estero del Chayo in a patch of open saltgrass (*Distichlis palmeri*). This species commonly forms mixed-species colonies, with Gull-billed Terns (*Sterna nilotica*) in North Carolina (Soots and Parnell 1975) and Caspian (*Sterna caspia*) and Elegant Terns (*Sterna elegans*) at Bolsa Chica, California (Schew and Collins 1991). On Montague, Black Skimmer nests were associated with 7 nests (containing 17 eggs) of Gull-billed Terns. Black Skimmers have bred at the Salton Sea, about 180 km north of Montague Island, since 1972 (McCaskie et al. 1974), and Montague might well have been the stepping stone to colonize the former. Black Skimmers evidently move between the upper Gulf and Southern California, as 4 of 17 Black Skimmers sighted at Montague on 23 March 1994 had been banded as chicks at Bolsa Chica (Eduardo Palacios and Salvador González pers. comm.).

American Oystercatcher (*Haematopus palliatus*). On 10 June 1993 we found a pair of American Oystercatchers in an area with saltgrass and exposed shell banks near the island's lighthouse. The area had been flooded the day before and no evidence of nesting could be found. However, the two individuals moved along together and performed a distraction display. This is a widespread breeder in the upper Gulf of California and very often nests adjacent to Least Terns (*Sterna antillarum*) (Mellink and Palacios 1993). Our observation very likely indicates its nesting on Montague, in close proximity to Least Terns.

Large-billed Sparrow (*Ammodramus sandwichensis rostratus*). This species is an abundant summer resident of the island, being found in all the grassy patches at least in the southern part of the island, and probably throughout it. This subspecies breeds only in the Colorado River delta area but migrates during the winter to the coast of southern California and northern Baja California (Unitt 1984, Wilbur 1987). Unitt (1984) reported a severe decline in the numbers of Large-billed Sparrows visiting southern California and suggested this was probably associated with habitat changes in the delta. On 10 June 1993 we found two eggs in different sites, on the ground. The area had been flooded the day before, and we could not determine the original location of the eggs.

These additions to the list of known breeding birds of Montague Island, although not unexpected, increase the biological value of the area. Isla Montague is now part of the core zone of a recently decreed biosphere reserve (10 June 1993), and although the breeding bird species were not considered in this designation, they are now protected by it.

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PYGMY NUTHATCH SWINGING PYGMY NUTHATCH IN SOUTHEASTERN ARIZONA

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During a trip to Sawmill Canyon in the Huachuca Mountains, Cochise County, Arizona, I observed a Pygmy Nuthatch (*Sitta pygmaea*) swing another Pygmy Nuthatch by the tail. On 30 July 1993, at approximately 12:00 noon, I was watching a small flock of Pygmy Nuthatches working their way down the trunk of a conifer, about 15 feet off the ground. As one nuthatch hopped down past another, the second nuthatch grasped the first's middle rectrices in its bill and swung the first bird once back and forth like a pendulum, for approximately 2 seconds. During this time, the first remained with its wings folded and did not appear to react in any way. The second bird then let go of the first's tail, and the birds continued to forage down the trunk of the tree. A review of the literature on nuthatches reveals no mention of similar behavior; indeed, I found no mention of similar behavior in any species of bird.

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FIRST NESTING RECORD OF THE LAUGHING GULL FOR THE WEST COAST OF BAJA CALIFORNIA, MEXICO

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From November 1992 to June 1993 we conducted biweekly bird surveys at Ojo de Liebre (Scammon's) Lagoon on the west coast of Baja California Sur, México. During our surveys we found four pairs of Laughing Gulls (*Larus atricilla*) breeding on Piedras Island (27° 42' 18" N, 114° 09' 36" W), one of five small and relatively low islands inside the lagoon (Figure 1).

On 9 May we found two occupied Laughing Gull nests 25 m apart on a gentle slope in the southern part of the island. One of these nests (nest 1) was constructed on pickleweed (*Salicornia* sp.) and contained one egg. Nest 2, constructed on Alkali Heath (*Frankenia* sp.), was empty. We marked the nests with aluminum tags and the nest sites with flags to facilitate their relocation. On May 16, we checked the nests again: nests 1 and 2 contained three and one egg, respectively. On this visit, about 700 m northwest of nests 1 and 2, we found a third pair of Laughing Gulls nesting on *Salicornia*, but they had no eggs. Eighteen days later (8 June), nests 1 and 2 contained three eggs each, but nest 3 was apparently abandoned. Measurements of four eggs averaged 55.6 by 39.1 mm. The egg-laying dates observed are consistent with reports (mid-April–May) from other areas (Terres 1980, Frohring and Kushlan 1986).

On 27 June, during our last visit, nests 1 and 2 were empty, without eggs or nestlings, but still occupied by the adults. Each nest contained eggshell fragments, and the adults remained close to them, alert, suggesting that nesting was successful and the young were probably still around. About 200 m southwest of nest 3, we saw another pair of Laughing Gulls (nest 4), but again we were unable to find any young.

The Laughing Gull has been reported as a regular winter visitor of both coasts of the Baja California peninsula south of 27° N (Wilbur 1987). There are two previous winter reports north of this latitude, one from offshore near San Felipe (Howell and Webb 1992), the other from the Río Hardy and Campo Mosquedo area (Patten et al. 1993), both on the east side of the state of Baja California (Norte).

The Laughing Gull breeds colonially, mainly on the east coast of the Americas (Small 1951, Richards 1990), ranging from Maine to South America (Friedmann et al. 1950, Peterson and Chalif 1989, Richards 1990). On the Pacific side, Laughing Gulls breed along the coasts of Guatemala and El Salvador in colonies of several hundred (Miller and van Rossem 1929), as well as on the coasts of Sonora, Sinaloa, and Nayarit, México (Friedmann et al. 1950, Richards 1990). North of the tropics, sporadic nesting has been reported from 1928 to 1957 on islands in the Salton Sea, California (Miller and van Rossem 1929, Small 1951) and more recently at Montague Island in the northern Gulf of California, where Palacios and Mellink (1992) found a small colony.

Prior to 1993, there were no records of Laughing Gulls at Ojo de Liebre Lagoon at any season (Bancroft 1927, Bostic 1975, Wilbur 1987). Massey and Palacios (1994), however, listed the species for this lagoon, on the basis of sightings in 1993 (E. Mellink pers. comm.). Ours is the first nesting record for this area, for the state of Baja California Sur, and for the west side of the Baja California peninsula.

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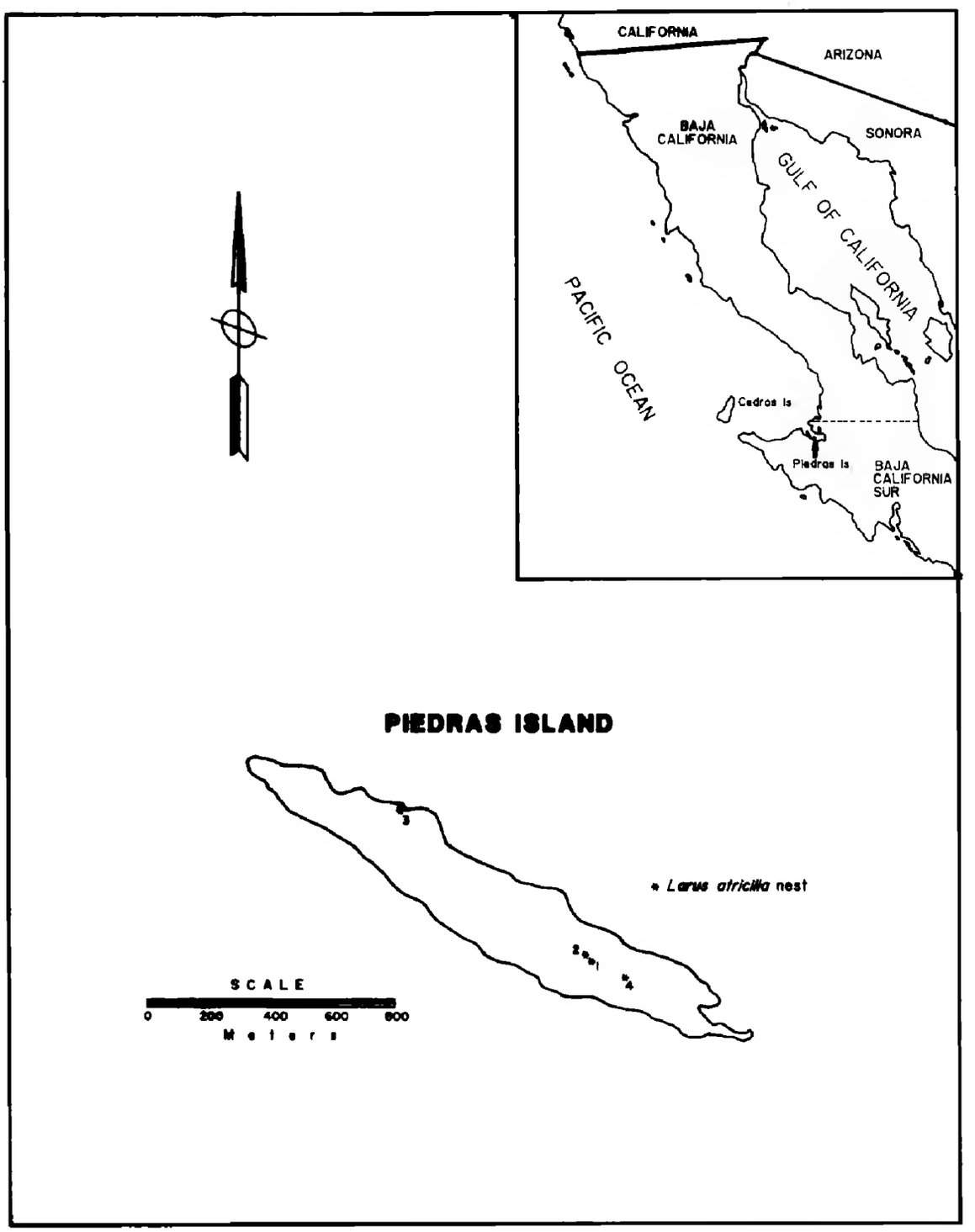

Figure 1. Locations of Laguna Ojo de Liebre (Scammon's Lagoon) and Piedras Island, Baja California Sur, México. Numbers specify Laughing Gull nests.

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CALIFORNIA SCRUB JAY FORAGES ON MULE DEER

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Two reports exist in the literature of oxpecker-like behavior in the Scrub Jay (*Aphelocoma coerulescens sensu lato*), one with Mule Deer (*Odocoileus hemionus*) in California (Dixon 1944) and one with feral hogs in Florida (Barber and Morris 1980). In 1944 Dixon queried, "have other[s] . . . observed this habit in our California [Scrub] Jays?" We here report an observation made 45 years later!

One of us, Campbell, lives near the base of the San Gabriel Mountains, at the northern edge of the Los Angeles basin. The house is on a knoll, surrounded by gardens with abundant shrubs and pine and juniper trees 40 years old. It lies adjacent to chaparral-covered slopes.

About 09:00 on 17 August 1987, Campbell was observing two Mule Deer on her back lawn leisurely eating ivy and pyracantha berries and leaves. Then a Scrub Jay hopped onto the larger deer's back and started pecking into its fur, eating whatever it found there. This deer stood still for 10 or 15 minutes while the jay foraged. The jay then repeated the procedure on the back of the smaller deer.

This observation and the previous one made in California involved a single jay feeding at a leisurely pace. This is in contrast to the Florida report, which involved a group of excited jays of which apparently only a single member repeatedly made forays of a few seconds onto the backs of feral hogs.

We thank Glen E. Woolfenden for providing copies of the earlier notes on this behavior.

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With this issue, Mildred Comar, *Western Birds*' volunteer indexer since 1975, retires. All readers owe her a debt of gratitude for making the information in the journal more accessible. Good indexing, though arduous and unglamorous, is essential to a scientific journal. Thank you, Mildred, for your 19 years of diligent work, a legacy of lasting value. So I am recruiting a new indexer; interested readers please contact me at the San Diego Natural History Museum, P. O. Box 1390, San Diego, CA 92112; phone 619-232-3821 ext. 235.

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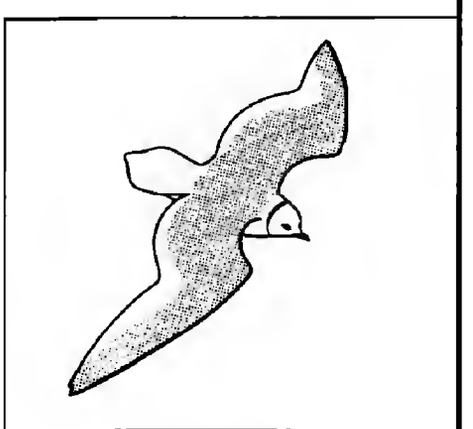

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